WHEN SUGAR TURNS TO SH%&: IMMEDIATE ACTION DECISION MAKING AND RESILIENCE IN HIGH RELIABILITY TEAMS

A Dissertation

by

BRADLEY SCOTT WESNER

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2011

Major Subject: Communication

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Approved by:

Chair of Committee,	J. Kevin Barge
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ABSTRACT

When Sugar Turns to Sh%&: Immediate Action Decision Making and Resilience in High Reliability Teams. (December 2011)

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Chair of Advisory Committee: Dr. J. Kevin Barge

Organizational scholars have long been interested in organizations which exemplify high reliability. While such organizational studies have provided valuable clues to the ways in which such organizations form and function, this paper argues that a more nuanced study of high reliability processes within team contexts is warranted. This study focuses on organizational teams which are faced with the challenges of maintaining high levels of reliability. Of particular interest is how teams manage adverse events which disrupt the team‘s process and how they make adaptations immediately to restore their functionality. In my dissertation, I: (1) explore the existing literature surrounding high reliability organization and resilience, (2) present a qualitative analysis of Special Weapons and Tactics (SWAT) teams to explore and identify factors surrounding adaptation within the critical moment, and (3) discuss the implications of these factors in the theory and research surrounding high-reliability teams.

The findings of this study find strong connection with the work of Weick and serve to advance and clarify previous characteristics associated with high reliability organizing; however, by using the small group as the unit of analysis for the study additions to concepts traditionally associated with high reliability organizing can be noted: (1) controlling variability during team function, (2) accepting the value of the unexpected, (3) continuous forward motion, and (4) the role of tacit and explicit knowledge.

DEDICATION

This work is dedicated first to my wife Kylene Wesner. Kylene has been my constant companion, editor, friend, critic, rock, and spouse during the course of the last four years at A&M, and without her assistance I would not have accomplished any of what I have. I love you sweet girl!

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To Texas A&M University and all those that have attended her: may the honor of this institution never be tarnished and our traditions never fade. Until the final muster sounds, Gig ‘em Aggies!

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To my Lord Jesus Christ for leading me back from the edge and providing me the grace to continue my work. All that I am is yours.

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CHAPTER I

INTRODUCTION AND

LITERATURE REVIEW

There are certain lines of work and organizational types which must remain error free. This need has increased over time as systems have evolved to greater levels of complexity. As organizational systems have grown more complex, they pose greater dangers to our ability to manage risks and prevent failures which can endanger society (Perrow, 1984a, 1984b). One only has to consider the ramifications of failures at nuclear power plants, offshore oil wells, and air traffic control facilities to recognize that maintaining an error free environment in such organizations saves lives and property. The concern for error prevention has generated a growing interest in high reliability organizations (LaPorte & Consolini, 1991; Weick, 1976, 1987, 1988, 1993a, 1998). Due to extraordinarily high levels of complexity and their embeddedness in society, these organizations must take on practices and procedures to insure the highest levels of reliability in organizational performance (Weick & Sutcliffe, 2007).

High reliability organizations (HRO's) have been conceptualized as organizations which, "operate continuously under trying conditions and have fewer than their fair share of accidents" (Weick & Sutcliffe, 2007). Weick (1987, 1988, 1993a) further stipulates that HRO's frequently demonstrate the following characteristics:

This dissertation follows the style of *Small Group Research*.

(1) careful attention to existing procedures, (2) limited trial and error activities, (3) redundancy in the system, (4) decentralized decision making, (5) continuous training with an emphasis on simulation exercises, (6) strategic prioritization of safety within the system, and (7) creation of a culture which is ever vigilant toward the potential of accidents.

A key limitation in previous research is that the concept of high reliability organizing has focused primarily on the organization as the unit of analysis as opposed to the group or team. While it may be argued that scholars interested in high reliability organizing have examined groups and teams while treating them as organizations (Weick, 1993a), organizational scholars have yet to explore systematically how high reliability organizing occurs within groups and teams. One notable exception exists in the health care organizational literature where High Reliability Teams (HRT's) have emerged as a focus within the last few years (Baker, Day, & Sales, 2006; Benn, Healey, & Hollnagel, 2007; C. S. Burke, K. A. Wilson, & Salas, 2005; Riley, S. Davis, K. Miller, & McCullough, 2010).

Both HRO's and HRT's experience unforeseen events which require them to adapt and recover quickly to avoid disaster (Rijpma, 1997; Shrivastava, Sonpar, & Pazzaglia, 2009). Yet, few attempts have explored the way adaptive behaviors within groups and teams allow them to manage critical disruptions of their processes. My dissertation attempts to address this gap in the literature by investigating these events and the concept of resilience within HRT's.

Resilience is defined as the ability to bounce back from adversity and resume normal levels of functionality (Gittell, Cameron, Lim, & Rivas, 2006). The ability to recover from a critical disruption has long been considered important and is typically associated with debriefing processes that occur after events such as Post Project Appraisals (PPA's) and After Action Reviews (Baird, 1999; Decety et al., 1997; Lipshitz, Popper, & Oz, 1996; Popper & Lipshitz, 1998; Schindler & Eppler, 2003). For example, PPA's are associated with large scale projects and are performed by an independent external team some time after project completion. An external team as opposed to the team that was responsible for completing the project is used given their higher level of objectivity. The team looks at the project from conception up to the time of the evaluation. A report is produced highlighting aspects of the project that were successful and those that were lacking with access to the report given to the entire organization so that all parties have an opportunity to learn from it (Gulliver, 1987; Schindler & Eppler, 2003). Alternatively, after action reviews are conducted immediately following critical disruptions and allow team members to quickly acknowledge successes and failures associated with the mission. These reviews may be very brief (a few minutes) or more detailed (several hours), but in every case the team must evaluate four crucial elements: (1) what was planned to happen, (2) what actually happened, (3) why differences occurred between what was planned and what actually occurred, and (4) what was learned from the experience. The goals associated with after action reviews include team learning, team accountability, and development of team trust (Schindler & Eppler, 2003).

While these debriefing practices differ in practice, they share a common theme as they focus on how participants reflect on the critical disruption and develop new strategies for success long after the event has transpired (Gittell et al., 2006; Heldring, 2004; Luthans, Norman, Avolio, & Avey, 2008; Powley, 2009; Youssef & Luthans, 2007). While such practices are important, my interest is in how teams adapt within the moment, without withdrawing from the unfolding situation, and reestablish functionality after a critical disruption. Simply, how does the team respond in the moment to make sense of the critical disruption, recalculate their efforts, communicate the recalculation to the other members of the team, and resume their activities?

I begin with a discussion of theories constituting high reliability organizing followed by a discussion of the research surrounding HRT's. I then focus on how theories of group development shed light on the notion of critical disruptions and how those disruptions impact group processes. Finally, I examine how the concept of resilience connects to group processes and conclude this chapter by presenting my research questions.

High Reliability Organizing

The two most prominent theoretical perspectives concerning reliability within organizations are Normal Accident Theory (Perrow, 1981, 1984a, 1984b) and High Reliability Theory (LaPorte & Consolini, 1991; Weick, 1976, 1987, 1988, 1993a, 1993b, 2004). With few notable exceptions (Shrivastava et al., 2009), the majority of scholars view the two theories as antithetical with Normal Accident Theory (NAT) advocating that accidents are an inevitable part of complex organizational functions and High

Reliability Theory attempting to describe practices which allow organizations to function for long periods in complex environments while experiencing few if any accidents. One approach to resolving the differences between these two theories rests on adopting a temporal perspective toward accidents noting that High Reliability Theory examines the dynamic situation and events which precipitate disruptions while NAT focuses on the organizational structure and the circumstances at the time of the disruption (Rosa, 2005; Shrivastava et al., 2009). This distinction allows for the application of both theoretical perspectives to the issue of high reliability and the potential for creating a more nuanced picture of high reliability organizing.

Normal Accident Theory (NAT)

Perrow (1981, 1984a, 1984b) posits that accidents are a normal part of complex system operation, and defines a normal accident as any unintended action or event that interferes with the output of a system. Using the system as the unit of analysis, he divides it into four levels or parts which come together to form the whole. The first level of the system is the individual component. Individual components which function together comprise the second level, the unit. Arrays of units combine at the third level to produce a subsystem. Subsystems combine into the complete system at the fourth level. The systems themselves exist in Perrow's concept of the environment. Let us consider a commercial aircraft's operation as an example. At the first level we find the individual component, for instance the individual ground worker, who has a set number of tasks which must be performed via his or her role. However, one individual ground worker is not sufficient to carry out all tasks necessary to care for the flight, thus other ground

workers are hired to perform additional tasks, and these individuals function together as a unit. Yet, aircraft are not simply run by ground crews, as there are other tasks that must be performed such as the actual flight of the aircraft, flight attendance, embarkation and disembarkation procedures, catering, etc. Each of these tasks is too complex for one individual component to handle, thus units are formed to complete their obligations. These units, working on vastly dissimilar tasks, contribute unique elements which make the flight possible, and integrate to form a subsystem. Each subsystem functions in the larger system, for example as part of an airline, doing its part to make sure that the airline functions as planned. Finally, each airline system functions in the environment of the airspace and airports in which the systems are used.

Perrow (1981) stipulates that disruptions at the first two levels, even those which interrupt the output of the entire system, do not constitute accidents and are referred to as incidents. Perrow stipulates that incidents may be controlled by redundancies and safeguards designed into the system to prevent them reaching the level of accident. Should these redundancies experience failure, any disruption which leads to an incapacitation at level three or four constitutes an accident (Tamuz & Harrison, 2006; Weick, 2004). To further illustrate Perrow's concept of how normal accidents occur, let us consider an electrical power grid as a complete system in which buildings form the subsystems and component lamps and light bulbs function together as units. An incident occurs when a light bulb or lamp fails which does not lead to either a sub-system failure or a broad system wide outage. Such incidents are easily accounted for and corrected without significant environmental impact. However, were a building's entire electrical

system to fail, or the entire power grid to blackout, this would rise to the level of an accident as it would radically impact the environment in which the system is functioning.

NAT stipulates that accidents normally originate at the lower levels as incidents in which one or more components fail and embedded redundancies are unable to prevent the spread of the failure to higher levels of the system. Central to NAT is the idea that incidents cannot be completely prevented even if better and more complete redundancies are used. Perrow argues that the systems themselves are too complex to control for the myriad of potential failures which may emerge. This perspective led Perrow to theorize that such events could not be anticipated or properly comprehended by designers in ways that might allow fully preventative measures to be implemented. Because of the inability to control for and correct the myriad of possible incidents which could take place at lower levels, Perrow theorized that some incidents would inevitably spread to levels three and four and precipitate systemic accidents. These normal accidents, resulting from failures at multiple levels are viewed as impossible to prevent (L. Clarke & Short, 1993; Hopkins, 2001; Perrow, 1984b).

Perrow contends that systems have two properties which leave them vulnerable to systemic accidents: (1) tight coupling and (2) complex interactions. Tight coupling exists in systems when minimal lag time exists between processes, the sequence of processes is static, only one method is used to complete the task, no variance is acceptable in supplies or personnel, and a substitution of supplies and personnel is not possible or could only be accomplished in a preordained manner (Perrow, 1981, 1984a,

1984b). Complex interactions which take place in unplanned sequences are either indiscernible or not understood immediately and are influenced by components with multiple functions, close proximity, and specialization of employees to a point which limits perspective taking (Perrow, 1984b). NAT also holds that system level accidents may occur under conditions of high system complexity and tight coupling. When such conditions arise, failures can trigger other failures which ripple through the system, a process that is aided by the tight coupling of the system itself, unchecked and in a manner that is not readily recognized and understood by humans interacting within the system and charged with monitoring its performance. These complex and tightly coupled systems allow little if any variance or lag time in interaction, thus when the ripple effect starts it quickly moves through various parts of the system and simultaneously brings system function to a halt. This rapid infection of systems precludes recovery or adaptation which might mitigate the development of accidents (Hopkins, 2001; Lagadec, 1997; Perrow, 1981, 1984b; Rijpma, 1997; Tamuz & Harrison, 2006; Weick, 2004).

High Reliability Theory

A number of scholars have explored the characteristics of organizations that are able to work for extremely long periods without a breakdown in production from the perspective of High Reliability Theory (Beyea, 2005; Gifun & Karydas, 2010; B. Miller & Horsley, 2009; Novak & Sellnow, 2009; Weick, 1987, 1988, 1993b; Weick & Sutcliffe, 2007). These kinds of complex organizations typically offer little opportunity for second chances and are normally under intense oversight from a variety of sources.

Organizational scholars have focused on identifying key factors and interaction patterns that lead to long periods of accident free work, particularly when the organizations function in highly volatile environments. Rather than embracing NAT's assumption that accidents are inevitable, High Reliability Theory assumes that accidents can be prevented in many cases and systemic catastrophe can be avoided (Shrivastava et al., 2009; Weick, 2004).

Weick (1987, 1988, 1993) notes that several conditions are necessary, but not sufficient for minimizing or eliminating error and maintaining reliability including: (1) careful attention to existing procedures, (2) limited trial and error activities, (3) redundancy in the system, (4) decentralized decision making, (5) continuous training with an emphasis on simulation exercises, (6) strategic prioritization of safety within the system, and (7) creation of a culture which is ever vigilant toward the potential of accidents. The enactment of these factors creates a state of "mindfulness" within the organization whereby individuals pay close attention to subtle differences in organizational patterns and routines.

To examine each of the conditions in greater detail, I will use the example of a high-speed rail system. Careful attention to existing procedure could be described as simply following existing rules which have been shown to work. Considering the high-speed rail system, procedure dictates that two trains could not be allowed to run in opposite directions on the same track. The resulting collision would be a disaster, and requires careful attention by operations to prevent such an event. This rail system would likely be all but devoid of trial and error procedures as well. For example, imagine that

there was no existing data on how long it might take to stop a 300 mph train when loaded with people. One can quickly see the absurdity of loading up the train with passengers to "see what would happen." Such an experiment exposes the operation to entirely too much risk, and would not be congruent with the needs of high reliability. Weick's third element, redundancy in the system, is also evident in the high-speed rail system. In such a system, the engineer is in charge of the train itself while central operations monitor the train's progress via computer to prevent error. Decentralized decision making is also evident, as the engineer is in charge of the train itself and makes the decisions necessary to maintain reliability. While this does not imply that the engineer is somehow cut off or removed from other sources of information, such as central operations, it does maintain that decisions are best made by those who are in direct observation of the events as they unfold. Similarly engineers, and all those associated with high-speed rail systems typically undergo continuous training via simulation exercises to hone their skills and prepare for disaster should it unfold. This simulation and training is part of the overall operational strategic prioritization of safety. Clearly, a rail disaster involving trains moving at such high speed could well involve hundreds or even thousands of civilians with limited opportunity for survival. To that end, the public relations nightmare resulting from such an event would prove disastrous making safety the highest priority. Finally, the rail system operators routinely seek to create a structure which is ever vigilant to the manifestation of accidents to prevent the resulting negative high visibility with the public and loss of trust.

Mindfulness emphasizes the importance of social cognition of the individual participants in the system. While individuals involved in organizations might view accidents as a normal break in the organizational routine resulting in a halt to production, Weick asserts that an accident is brought about by a break in the mindful attention of participants toward the evolving organizational system. He claims that too much emphasis has been paid to the idea of routine and repetitive activities noting that routines of individuals even in the most mundane tasks are unstable and prone to fluctuations emanating from the environment surrounding those routines. The nonstandardized nature of routine and repetitive activities make minor breaks from routine the norm of organizational life. Weick (1998) embraces the idea of variance in behavioral routines and contends that that reliability is not achieved by mindlessly performing a standardized routine; rather, it is the result of patterns of cognition and communication that pay attention to, and carefully manage, fluctuations and variance within a system. As an example, consider an inspector at the end of an assembly line. Thousands of parts move down the assembly line every day, and the inspector is charged with determining if some variance exists between the parts that would cause error in their function. Weick's assertion here is that the repetitive nature of the task, or its simplicity, is not the key to preventing errors in the process. Rather, Weick stipulates that the key to preventing error is that the inspector maintains a cognitive consciousness to the task that he or she is performing. This change in focus from the routine of production to cognitive consciousness reflects Weick's (1987, 1998) perspective toward organizing where

variance is the norm, routines are rarely stable, and the worker's role is to make sense of that variance and manage it by being mindful of difference and variability.

Weick (1993a, 1993b) associates mindfulness with a particular approach toward sensemaking that is characterized by a preoccupation with failure, a reluctance to simplify interpretations via generalization, a sensitivity to operations with an emphasis on "big picture" or system level thinking, a commitment to resilience applicable to both the organization and the individual's role in the system, and finally an ambivalence toward specified structure and decision making via inflexible hierarchical roles. There is a high degree of similarity between these characteristics of sensemaking and the seven features of high reliability organizations. For example, by avoiding the formulaic and disciplined approach toward sensemaking that often occurs within hierarchies, Weick and Sutcliffe (2007) argue that decision making should travel with the problem itself and fall to the people who have the most knowledge of the problem. This stands in sharp relief to rigidly structured hierarchy based decision making models in which the ability to make decisions is based on position in the company and not positional relevance to the issue itself (West, Patera, & Carsten, 2009). Weick argues that the efficiency and quality of decision making made at the same level at which the problem occurs is essential for allowing rapid correction to systemic variance, but requires the highest levels of competence among individuals at every level of the system (Weick, 1987). Central to adaptability is a structure which is loose enough to allow for the decision making to travel with the problem, yet tight enough to prevent the group from fragmenting and having its process break down.

High Reliability Teams

Most literature associated with issues of high reliability has focused on characteristics of organizations and their members. Only recently have studies attempted to assess the role of teamwork as it relates to high reliability organizing. High Reliability Team (HRT) studies have largely been conducted within healthcare organizations. These organizations have pursued high reliability for a variety of reasons including a desire to avoid malpractice claims (Knox, Simpson, & Garite, 1999), form more efficient surgical teams (Benn et al., 2007; Leach, Myrtle, Weaver, & Dasu, 2009; Undre et al., 2007), and improve efficiency within nursing units (K. Miller, Riley, & S. Davis, 2009). HRT's are viewed as a necessary building block of the HRO. These studies tend to stipulate the key components of HRO's and then illustrate the way that medical teams manifest those components (Autrey & Moss, 2006; Baker et al., 2006; McKeon, Oswaks, & Cunningham, 2006; Riley et al., 2010; K. A. Wilson, C. S. Burke, Priest, & Salas, 2005).

The HRT literature begins with a fundamental proposition that HRO's are more easily created when HRT's are used as a building block (Baker et al., 2006; C. S. Burke et al., 2005; K. A. Wilson et al., 2005). The authors indicate that creation of the HRO becomes possible if the teams themselves manifest HRO characteristics, and therefore, not surprisingly, most research has tended to document the presence of those characteristics within teams. K. A. Wilson et al. (2005) notes that HRT's exhibit five of the characteristics previously highlighted by Weick's (1987, 1988, 1993) sensemaking and decision making work: (1) sensitivity to operations, (2) commitment to resilience,

(3) deference to expertise, (4) reluctance to simplify, and (5) a preoccupation with failure. The presence of these five characteristics in HRT's are supported by a variety of empirical studies (Baker et al., 2006; Benn et al., 2007; C. S. Burke et al., 2005; Riley et al., 2010).

The HRT literature has also sought to describe the processes by which teams might be trained to develop their capacity for functioning as a HRT. Practices that are associated with facilitating high reliability in teams include simulation, briefings prior to executing team tasks, debriefings following those team tasks, constant situation awareness during team interactions by all members, closed loop communication during team process, and an emphasis on the creation of shared mental models among team members (Benn et al., 2007; C. S. Burke et al., 2005; Riley et al., 2010; Undre et al., 2007). Briefings set the stage for the creation of shared mental models, as team members can question others with different types and levels of expertise in an effort to form homogeneous mental constructs which later guide their team interaction. Similarly, conducting debriefing activities following team meetings or projects allows team members to share and institutionalize mental constructs, determine what has gone well or poorly during the interaction, and construct agreements regarding how the team should function. Situational awareness is valued during team interaction as essential for identifying irregularities in processes which might later manifest as errors and is envisioned as a method of fostering a preoccupation with failure. Finally, closed loop communication utilizes standardized language among team members with commands

being repeated back to the sender in an effort to promote accuracy and reduce errors due to ambiguity.

HRTs are treated as the building blocks for HROs and the assumption is that the qualities of HRTs, the conditions that promote the development, and the way that HRTs recover from critical disruptions are identical to HROs. However, teams are much smaller in scale than organizations which may prove easier to manage and monitor. This size difference presents interesting opportunities when issues of recovery and event management are considered. For example, Perrow (1984a) argues that organizational complexity eliminates the possibility of anticipating accidents and hampers rapid recovery. This position was later partially supported by further research indicating that the organizational process deteriorates slowly over time with a gradual drift into chaos manifesting in a systemic breakdown or accident with the symptoms of disaster being both too numerous and too complex to decipher (Snook, 2000; Turner, 1997). However, each of these accounts is focused on large organizations, and is rooted in the idea that such large organizations are made overly complex by their size. Due to their enormity, monitoring and deciphering the millions of signals simultaneously emitting from such a complex and widespread organizational structure and then coordinating a multifaceted recovery process from an unanticipated event appears daunting if not impossible. However, it is likely that at a team level fewer signals should be emitted and less coordination would be necessary to facilitate adaptation to an unforeseen event (Moldoveanu & Bauer, 2004; Morgeson, 2005). To better understand how teams

anticipate and recover from such critical disruptions, an examination of the scholarship regarding small group process and management of critical disruptions is necessary.

Managing Transitions and Critical Disruptions in HRTs

Linear phase models have informed group theory for many years (Cissna, 1984; Gersick, 1988; Mennecke, Hoffer, & Wynne, 1992; Poole, 1983a), but have been challenged by a growing number of small group theorists who argued for nonlinear approach to modeling group phases and processes. They argue that linear approaches fail to adequately explain changes, stage transitions, or the environmental impact on group process (Mennecke et al., 1992; Pattit & Wilemon, 2005; Poole, 1983a, 1983b; Poole & Roth, 1989; Wheelan, 1990, 1994). In this next section, I discuss the stage transitions which occur during group processes using Poole's (1983a, 1983b) multiple sequence model as a framework for discussion. I then present several additional models pertaining to group adaptation and conclude by discussing the literature surrounding resilience from such unexpected events.

Stage Transitions and Group Life

Regardless of whether a linear or nonlinear perspective is taken toward group process, one commonality which exists between these two perspectives is the idea that groups do evolve. Groups rarely remain static for long periods and are often marked by their ability to transition through a number of processes and produce results. Perhaps one of the most comprehensive descriptions of these stage transitions is provided by Poole's (1983a, 1983b) multiple sequence model.

The multiple sequence model. Poole's (1983a, 1983b) multiple sequence model assumes that the linear model of group development represents only one of many process sequences that may characterize group development noting that groups do not always function in normal sequential patterns of predictable phases. Group development may be described as being either nonphasic or phasic as well as linear, nonlinear, and cyclical. Poole's multiple sequence model uses three different group activity tracks and the way they unfold and intersect to describe the group development process: (1) task-process activities, (2) relational activities, and (3) topical focus activities.

Task-process activities. These activities are dedicated to achieving the group goal. These activities carry out the function or goal that the group has agreed upon and can include key functions such as information gathering, decision evaluation, and process implementation. These activities may focus attention on the problem itself, serve some organizational function, or may be dedicated to finding solutions to some problem (Poole, 1983a, 1983b; Yoon & Johnson, 2008; Kuipers & De Witte, 2005; Gurtner, Tschan, Semmer, & Nägele, 2007).

Relational activities. Relational activities aid in defining and maintaining relationships within the group and foster participant cohesion. For example, the leader of the group may be more critical of ideas presented during evaluation. This functionality defines the group leader's role in the group and establishes his or her relationship to other group members. These relational activities not only maintain relationships but also define roles within the group and normative intra-group behaviors. Poole notes four distinct relational activities which characterize group processes: (a)

discussion of work, (b) conflict management discussion, (c) idea connection between members, and (d) managing uncertainty regarding relationships (Alavi & McCormick, 2008; Ballard, Tschan, & Waller, 2008; Kanawattanachai & Yoo, 2007; Poole, 1983a, 1983b; Yoon & S. Johnson, 2008)

Topical activity. The topical activity track concerns themes and arguments which are of immediate concern to the group at a particular point in the group's processes. These topical issues are those that the group is actively engaged in discussing and are part and parcel of the meetings that are taking place. One could conceive of topical issues as the current item on the agenda for the group to consider, as these items are currently the focus of the group's efforts at any given moment in the groups function (Poole, 1983a, 1983b; Yoon & Johnson, 2008).

As the group process develops the group naturally transitions from activity to another but not necessarily in the phasic or linear manner that has previously been theorized. Poole notes that groups can jump from one process to the next without completing one task prior to starting another. Furthermore, groups can return to a previously discussed topic if necessary. Poole differentiates among three different types of group transitions: (1) normal breakpoints, (2) delays, and (3) disruptions (Poole, 1983a, 1983b; Poole & Roth, 1989). The notion of group transitions is similar to the literature regarding event based research and team routinization (Dohrenwend, Raphael, Schwartz, & Stueve, 1993; Lee & T. R. Mitchell, 1994; Olson-Buchanan et al., 1998; Thomas, 1992; Tindale et al., 2002; Trevino, 1992). Each of these literatures implicitly or explicitly distinguishes among different types of group transitions by event criticality,

the severity of the event or transition and its potential to impact the team (Morgeson & DeRue, 2006). Using the notion of event criticality, group transitions can range from minimally impacting team activity to severely disrupting team activity.

Normal breakpoints. Normal breakpoints are defined as events which are typically associated with group processes and can be anticipated by most groups as a normal process of transitioning from one task to the next. Here the focus is on pacing of the group process itself. For example, if we consider task-process activities engaged in by an organization task force formed to analyze and make recommendations on a given problem, the group might typically break a project down into workable segments and then complete each task in turn. As the group finishes each task a normal breakpoint is reached and the group proceeds to the next task at hand. The group continues to work through the series of tasks until the whole project is completed. When groups experience normal breakpoints in this fashion the need for complex sensemaking activity is relatively limited as these breakpoints are common across teams and unfold according to normalized and predictable sequencing. To that end, the members of the group may focus their attention on the tasks at hand, complete those tasks, and quite naturally move on to additional stages of the process inclusive of additional tasks without significant mental effort dedicated to the process of managing the transition (Poole, 1983a, 1983b; Poole & Roth, 1989; Poole & Van de Ven, 2004).

Delays. Poole's (1983a, 1983b) concept of delay represents a second kind of group transition. Poole defines delays as constituting a distinct break from the decision making process, with the group consciously working on a specific problem until the

problem is overcome. Encountering a problem of this nature constitutes a unique transition as group progress stalls until the problem is solved and the group transitions to some other activity. Scholars have also referred to delays as "problems" (March & H. A. Simon, 1993), or "events" (Trevino, 1992; Weiss & Cropanzano, 1996); however, regardless of the name that is used scholars agree that delays constitute a disruption to normal and productive processes. Delays may result from lack of agreement, hostility among group members, or group members straying from the topic of discussion. Delays typically impede the progress being made by the group causing productivity to slow dramatically, or stop completely, until the delay is overcome. The halt in productive activity may result in feelings of frustration by group members who are forced to put processes on hold until the delay is resolved. Poole (1983a, 1983b) notes that while delays may be unnecessary and negative, they can also prove beneficial to team processes which have become stagnated as they allow the team to slow down their pacing, foster creativity, and at times leap forward in the process of finding creative solutions for overcoming delays which revolutionize processes.

Consider a group discussion in which one group member voices a dissenting opinion from the rest of the group which generates conflict. The progress of the group is slowed until the conflict is resolved. In some instances, resolving the conflict may be as simple as allowing additional group members to voice perspectives which in turn provide information that the disenfranchised parties did not yet have. However, it is also possible that the information provided by the dissenting voice sheds light on some critical oversight that would have negatively impacted the group's eventual product had

the issue not been addressed and resolved. In this case, resolution of the conflict leads to group creativity and innovation.

In contrast to normal breakpoints, delays may require more complex efforts at sensemaking (March & H. A. Simon, 1993; Weiss & Cropanzano, 1996). This is due to the fact that delays are not anticipated by the most groups and thus are outside the orderly way that the group expects events to unfold. Also, while within the group delays are difficult or impossible to predict, some scholarship has noted that leadership that is external to group process may be capable of anticipating delays and even preparing the group to deal with delays should they occur (Morgeson, 2005; Morgeson & DeRue, 2006).

Disruptions. Disruptions represent a third type of group transition and are defined as either a major disagreement or conflict causing redirection of the group's efforts and reorientation prior to getting back to production, or group failure in which the processes that the group engages in are insufficient for completion of the task at hand. Disruptions are associated with severe complications to the team that, unless resolved, will prevent the team from accomplishing its goal (Engwall & Svensson, 2001; London & Sessa, 2006; Poole, 1983a, 1983b; Van der Vegt & Bunderson, 1996; Yoon & S. Johnson, 2008). In the events and faultlines literature the concept of disruption has been described using a variety of terms such as "fires" (Kotter, 1982), "shocks" (Lee & T. R. Mitchell, 1994), and "surprises" (Louis, 1980). Furthermore, the literature characterizes disruptions as manifesting from within based on issues with group composition and ideology (Homan, Knippenberg, Kleef, & Dreu, 2007; Lau & Murnighan, 1998; Li &

Hambrick, 2005; Molleman, 2005; Rico, Molleman, Sánchez-Manzanares, & Van der Vegt, 2007; Sawyer, Houlette, & Yeagley, 2006). To illuminate the concept, I will present several theoretical concepts which emphasize the phenomenon of disruption including faultlines, bifurcation points, and cosmology episodes. While each of these theoretical perspectives takes a different perspective toward what counts as a critical event within a group's activity, all seem to fall under Poole's larger categorization of disruption.

First, faultlines are defined as the lines which divide groups into homogeneous subgroups based on social and demographic characteristics (Lau & Murnighan, 1998). For example, faultlines might exist if a group of older male senior vice presidents in a construction company were placed on a team working with young female civil engineers. Faultline theory suggests that clear lines of ideological and demographic division within the group are likely to cause splits within the team and subsequent disruption within the resulting subgroups (Homan et al., 2007). Faultlines may be latent or active. Latent faultlines are based on observable demographic characteristics within the group while active faultlines are present when the members themselves act on perceived differences and behave within subgroups as if such differences are present (Homan et al., 2007; Lau & Murnighan, 1998; Li & Hambrick, 2005; Molleman, 2005; Rico et al., 2007; Sawyer et al., 2006). Faultlines have the potential to disrupt groups along ideological and demographic lines and, if left unattended, may cause the group process to fail.

The task of sensemaking by participants is complex when managing faultlines. The members of the group must be able to recognize the nature of the faultline and then make the necessary adjustments to move forward. The task of figuring out what must be done involves consideration of far more variables and contingencies than delays. Furthermore, those involved must completely depart from their original plan for operation and quickly conceive of a new plan for success while translating that plan to all team members quickly and in a way that makes sense. The difficulty in making this adjustment is due largely to the differences in ideology and orientation to the task given the aforementioned ideological and demographic differences. This makes the task of sensemaking particularly difficult. Finally, when we consider the mental taking necessary to lay aside differences in based upon ideology and demographic factors, the task of sensemaking is immense.

Second, bifurcation points represent a type of disruption that is tied to changes in a group's trajectory. Complexity Theory notes that change can be evolutionary and constant yet also recognizes that all change is not incremental within systems, and thus introduces the concept of bifurcation points to account for more radical and revolutionary sudden changes within the system (P. Anderson, 1999; Byrne, 1998; Maguire & McKelvey, 1999; McKelvey, 1999). Bifurcation points are defined as a point in the life of a system or group in which it is faced with the necessity of a change that is capable of altering its trajectory completely and are normally brought about by unanticipated radical changes which impact progression of the group (Manson, 2001). During these crucial transformation points, systems normally "choose" between one of

two distinct trajectories as a result of the system being perturbed, or impeded in some way. As an example, if perturbation A occurs, a system may choose either trajectory B or C, and the system will be transformed and evolve quite differently depending on which option is chosen. Similarly the concept of bifurcation lends itself to the concept of group adaptation, and implies that in the presence of an unforeseen event, the group is capable of adaptation based on the state of the group at the time of the event and the event itself. Thus, if a team experienced a perturbation which destabilized the original trajectory of the team, the team would be forced to adapt radically and suddenly in order to maintain function (Farazmand, 2003; W. L. Miller, Crabtree, McDaniel, & Stange, 1998; Radford, 2008). As an example, consider a group of firemen who plan an entry to a building through the front door only to open the door and have the ceiling beyond the door collapse. In this example, the collapsed ceiling becomes the bifurcation point as it impedes the original trajectory of the group, and if the group is to complete its task it will have to choose another trajectory to do so. Extending the example a bit further, our firemen might choose an alternate entry point such as a side window or back door and thus find another trajectory to accomplish their mission.

Finally, cosmology episodes represent a type of disruption to group activity where the group's orientation to their social world is completely overwhelmed and undermined. According to Weick (1993a), "A cosmology episode occurs when people suddenly and deeply feel that the universe is no longer a rational, orderly system. What makes such an episode so shattering is that both the sense of what is occurring and the means to rebuild that sense collapse together. Stated more informally, a cosmology

episode feels like vu jade—the opposite of déjà vu: I've never been here before, I have no idea where I am, and I have no idea who can help me" (p. 633). Given the severity of these types of events, the mental effort necessary to make sense and recover from these is quite high. When such a disruption to the process takes place, the normal progression of the team stops and high levels of alteration to the trajectory of the team must be made. In some cases, particularly for events rising to the level of cosmology, a complete reassessment of what is possible must be made. An example of a cosmology episode would be the September 11, 2001 attacks on the World Trade Center. In that particular case, public servants such as police and firemen as well as citizens in organizational structures had no concept of terrorists hijacking planes and using them as weapons. Weick argues that making sense of such an event requires an almost unimaginable effort, particularly within the moment itself, and seems to push the boundaries of what is possible for the team or organization to do (Weick, 2001). Thus, such an event requires massive effort to adapt rapidly to maintain function and in doing so presents opportunities for rapid advancement.

Managing Critical Disruptions

Whether one subscribes to the notion that accidents are an inevitable reality of organizations (Jemal et al., 2008; Perrow, 1981, 1984b) or if one believes that accidents may be avoided by anticipating and responding to anomalistic variance within the system (Shrivastava et al., 2009; Weick, 1987, 2004), it is important for a group or team to bounce back from critical disruptions. Critical disruptions may be defined as being a type of disruption which is high in event criticality and has great potential for disrupting

group activity. Critical disruptions must be managed in order for a system to properly function and resilience is typically viewed as an important concept in explaining how teams and organizations recover from critical disruptions (Jemal et al., 2008; Perrow, 1981, 1984a, 1984b; Shrivastava et al., 2009; Weick, 1976, 1988, 2004).

Resilience has been noted as a critical resource for individuals, groups, and organizations facing uncertain and disruptive conditions which impact normal operations. At the individual level, resilience is associated with hearty or persistent persons (Masten, Cutuli, Herbers, & Reed, 2002) or as a genetic attribute (Tugade & Fredrickson, 2004). At the organizational level, the concept of resilience is often characterized as a set of social processes that allow the system to get back on track following a severe disruption (Gittell et al., 2006). Gittell et al. suggest that resilience is informed by two assumptions: (1) resilience is a latent capacity within an organization which is constructed through social interactions over time, and (2) resilience most often manifests itself when an organization experiences a disruption. A number of scholars suggest that resilience is something that silently builds within an organization through years of interaction, training, and preparation; and it is only made evident at the time that it is needed. Those scholars note that resilience takes place over an extended time frame during periods of reflection and recovery (Gittell et al., 2006; Heldring, 2004; Luthans et al., 2008; Powley, 2009; Youssef & Luthans, 2007). Periods of reflection and recovery are described by Powley (2009) as a “temporary holding space” in which the normal activities of the organization are suspended for readjustment. Only limited research has been dedicated to how individuals and organizations recover from within

the moment of a crisis (Crichton, 2001; Freedman, 2004; Paton et al., 2008; van der Schaaf, 1995; van der Schaaf & Kanse, 2004).

Regardless of whether resilience occurs during a period of reflection and recovery or within the moment of crisis, resilience requires that participants recognize obstacles to their progress and then make decisions which allow them to overcome those obstacles. Such decision making is associated with the participant's ability to draw on existing knowledge or mental constructions in order to figure out how to move forward in a productive manner (Schon, 1975, 1983; Weick, 1987, 1988, 2001). There are at least two dimensions that we can use to distinguish among strategies for recovery. One dimension regards the issue of consciousness, distinguishing among strategies and practices that use either tacit or explicit knowledge. The former is more preconscious with the latter being associated with mindful conscious activity. A second dimension regards temporality (Polanyi, 1966). Some strategies involve preparation, an engagement with activities such as planning and environmental scanning that occur prior to a critical disruption (Aguilar, 1967; Mendonça, Pina e Cunha, Kaivo-oja, & Ruff, 2004; Schuler, 1989a), while other strategies are distinguished by periods of reflection which take place after the event has transpired (Baird, 1999; Lipshitz et al., 1996; Popper & Lipshitz, 1998; Schindler & Eppler, 2003).

Consciousness: Explicit and Tacit Knowledge

Consciousness is typically defined as an actor's awareness that they are accessing data from their memory (Conner & Gunstone, 2004; Gutbrod et al., 2006). Consciousness assumes a level of awareness regarding how knowledge is accessed and

used by people to take action. On the other hand, a growing number of scholars contend that people's activity may also be more preconscious and intuitive (Conner & Gunstone, 2004; Morgeson, 2005; Raelin, 2007; Schon, 1983). It becomes important, therefore to distinguish between two types of knowledge and how they are used—explicit and tacit knowledge.

Explicit knowledge is information that is accessed through the mindful effort of an actor for application in a given situation and can be explicitly articulated by the individual (Conner & Gunstone, 2004; Gutbrod et al., 2006). Perhaps the most common example of this type of knowledge can be seen when participants face question and answer sessions in which the actor is cognizant of the fact that the knowledge he or she possesses is being called upon with the participant making an active effort to bring such knowledge to the forefront of their mind to address a specific need or inquiry. In contrast, tacit knowledge is knowledge which is intuitively drawn upon during practice within a specific context and is rooted simultaneously in both the context and the practice of action within that context (Polanyi, 1966). This knowledge is normally drawn upon and demonstrated in the moment and is engrained within the mind of the individual prior to the moment itself (Morgeson, 2005). This type of decision making is often described by researchers and observers as intuitive or precognitive, with participants often incapable of articulating the moment-by-moment nature of evaluative processes involved in arriving at the correct decision. Rather, the participants have some sense of what action might be inferred as correct without having the capacity to indicate why they behaved in the particular way that they chose (Gelenbe, Seref, & Z. Xu, 2001;

Lighthall et al., 2003; Maudsley & Strivens, 2000; A. M. Mitchell, Fioravanti, Founds, R. L. Hoffmann, & Libman, 2009). Here participants carry out actions which border on the instinctual without conscious effort to stop and think. Yet, what is actually happening is that the individual is drawing upon a vast array of previous experiences organized into mental schemas. This process has been referred to as "withness" thinking and is rooted in actions which appear "off the cuff" or spontaneous and unplanned (Shotter, 2006) and demonstrate what Schon (1983) refers to as reflection-in-action or the process of reflecting on pervious events in motion in order to rapidly access cognitive schemas and make sense of a currently unfolding situation through application of those previous experiences.

Tacit knowledge is accumulated through experiences which accrue over many years or episodes which take place in similar contexts. By drawing on our previous experience, we become able to recognize similar situations and quickly recall information which can be applied to those situations and enable us to move forward (Schon, 1983; Simon, 1989). That process of moving forward is highly applicable to critical incidents, as such incidents occur within the moment and allow little if any time for the actor to critically reflect on and evaluate the situation at hand via explicit knowledge application. Rather, during such a moment, the actor is forced to react within the moment itself and make decisions which allow the participant to make enough sense of the moment to connect with existing cognitive schema and react. Even when facing situations that have not been previously experienced or simulated, existing schemas may find enough similarity to adapt and "fit" the new situation. Raelin (2007) suggests that

when such a situation is encountered that even though we may at first see no way forward we still "plod along" in an effort to make sense of and overcome the new experience. This effort can also be aided by the company of other individuals who are simultaneously working to overcome the situation and who are in dialogue and cooperation with us. As an example, consider an expert in a given field. Experts develop expertise by acquiring skills across a variety of contexts and environments rather than just a single one. Thus, when the environment changes suddenly they simply draw on their vast array of experiences to find one that either matches the situation that they now face or fits closely enough to be adapted to work (Conner & Gunstone, 2004; Morgeson, 2005; Raelin, 2007; Schon, 1983).

Temporality: Preparation and Reflection

A second dimension of that can used to distinguish among recovery strategies exists at the temporal level. This dimension relates to the ways that individuals ready themselves for action, alone or in concert with others, the assessments that they make after the action, and the knowledge that they gain from these assessment for future endeavors. These kinds of activities can occur prior to a disruption to sensemaking when people prepare for the possibility of disruption or afterwards when people reflect on the event and try to make sense of it.

A critical component of the recovery process is preparation which occurs prior to the disruption. The concept of preparation should be considered quite distinct from that of planning in that planning implies the application of a strict structure or at least a set of ground rules for managing the event. Preparation in contrast implies an orientation of

self to the context that surrounds us or may soon surround us in anticipation of our interaction within that context (R. Anderson, Baxter, & Cissna, 2004; Shotter, 2009). Preparation involves getting ready for the activities that face us before we engage them. To do so prepares us mentally for what we will face by orienting us to the task and those around us. In the context of groups this implies recognition of "otherness" and how our own outgoing activities will be accepted and reflected back to us by others as we coordinate our activity. In the course of preparation, we adjust bodily to the situation we will face as our muscles and nerves become attuned to the events surrounding us and the context we will face. This understanding of the scene we will face prepares us for what we will soon interact with: what we will see, feel, hear, and experience (Shotter, 2009).

Preparation extends to how we make use of the scene we face in order to anticipate how we should orient ourselves to others in the scene as it unfolds and anticipate how others will orient themselves to us. One tool for anticipating the action of others within the organizational literature is environmental scanning. Aguilar (1967) notes that scanning the environment is the activity of acquiring information through purposeful searching as well as through undirected or less formal means. Environmental scanning is a process of surveying the environment and interpreting results to identify events, elements, and conditions that have the potential to impact an organization or organizational strategy (Mendonça et al., 2004; Schuler, 1989b). It provides a means to focus on continuously changing environments which require constant evaluation and systemic adaptation to compete (Albright, 2004; Engau & V. H. Hoffmann, 2011; Graefe, Luckner, & Weinhardt, 2010; Hiltunen, 2008; Kohn, 2005; Mendonça et al.,

2004; Saonee Sarker & Suprateek Sarker, 2009; Schuler, 1989b). Environmental scanning connects with Weick and Sutcliffe's (2007) notion of preoccupation of failure as well as Schon's reflection-in-action as it directs attention outward, paying close attention to people and processes in the larger environment.

While environmental scanning has normally been studied at organizational levels, it is also a preparation process that we all go through at some level in our daily interactions with others. This is particularly the case when we are experiencing new situations. For example, as Shotter (2009) points out, we orient ourselves to others via our expectation of what they will do in return during the interaction and, in particular, what how we would like them to orient themselves to us. Using Shotter's example of meeting a new person for the first time, we prepare ourselves by adopting a pleasant tone of voice, we hold out our hand to meet theirs and react appropriately to them doing the same. This process of continuous preparation and assessment through constant scanning and reaction to that scanned information allows us to orient ourselves to the situation as it develops so that our actions are appropriate and effective. Finally, by scanning the environment continuously we also can begin to prepare ourselves for critical events by anticipating them based on the context of the situation as it unfolds. For example, if we consider a fireman entering a burning building, the context of the situation itself would drive the fireman to a heightened level of awareness of the developing situation, and through the officers continuous assessment of the developing fire as he/she made entry into the building the potential of a ceiling collapse could be assessed and that event could be anticipated based on the assessment of the variables impacting it.

Critical reflection, in contrast to the prospective nature of preparation, is the retrospective process of looking back at prior actions and determining if those actions constitute the best way to do things (Raelin, 2007). Raelin stipulates that those engaged in critical reflection exhibit seven characteristics: (1) they question why things are done in particular ways, (2) they accredit local and informal types of knowledge which has been accumulated over time, (3) they consider historical and social processes which impact decision making process, (4) they allow for nontraditional forms of knowledge such as emotion and intuition to enter into inquiry processes, (5) they question their own questions and never quite trust even their own mastery of knowledge, (6) they look for discrepancies between whey they and others say and what is actually done in the end, (7) and they try to become aware of how their reasoning may become self confirming. By engaging in the process of critical reflection, the practitioner maintains an ever vigilant status in which he or she is constantly looking to themselves, others, and the processes they are engaged for ways in which processes may be refined and improved. This vigilance and unwillingness to accept that things are "good enough" creates an environment where practitioners never stop learning and striving for improvement.

While reflection of this nature is normally considered a solitary process in which the individual actor is engaged in self critique, the process can involve the presence of others who may contribute to the process by providing knowledge the individual does not yet have or by reinforcing concepts that are already known. Thus, the process of critical reflection within a societal or organizational group has the capacity to transform us in that it may expose us to concepts that we can learn and begin to use or it can

reinforce that previously learned concepts are now being put into practice correctly and efficiently. The concept of having our performance and knowledge examined by others may at first be disconcerting, but if those involved are themselves committed to improvement through critical analysis an environment is formed in which continuous improvement is possible (Gutbrod et al., 2006; Raelin, 2007; Schon, 1983). Reflection allows for participants to learn from each other through engaged practice and advances the creation of new schema.

One example of this type of communal critical reflection is that of debrief or after action review. This type of review referred to by Schon (1983) as reflection-on-action, is an opportunity for team members and observers to reflect on the actions of the team following operations with a critical eye for what went well and what went wrong (Baird, 1999; Decety et al., 1997; Lipshitz et al., 1996; Popper & Lipshitz, 1998, 2000; Schindler & Eppler, 2003). Furthermore, this activity allows other team members to fill in any deficiencies in the story of others. This process allows organizational learning to occur in which members begin to learn and develop their own skill set based not only on their own experiences but the experiences of others as well. This communal cognitive process allows for constant adaptation and learning by the team which produces the communal cognitive schemas necessary for tacit knowledge development (Baird, 1999; Gelenbe et al., 2001; Lipshitz et al., 1996; Popper & Lipshitz, 1998; Schindler & Eppler, 2003; Swaak, van Joolingen, & de Jong, 1998).

Taken together, the two dimensions of consciousness and temporality provide a framework for distinguishing among different kinds of recovery strategies or activities

that foster resilience. In turn, they provide a way to understand how high reliability teams are able to develop their capacity for anticipating potential disruptions as well as how they learn from them.

Rationale and Research Questions

High reliability teams strive to manage critical disruptions to their organizing processes quickly and efficiently in order to prevent significant damage to people, communities, and the environment. While NAT and HRT provide competing theoretical perspectives about the nature of disruptions and how those disruptions might be recovered from, the research has been primarily centered on organizations as opposed to small groups or teams. The lack of connection of NAT and High Reliability Theory to the team level is somewhat surprising considering that modern organizations often make use of teams to deliver critical goods and services which are subject to similar anomalies faced by organizations and require adaptations by the team in order to return to production. My dissertation explores the connection between high reliability organizing and team recovery from critical disruption.

While there is a growing literature on HRT, the current research has tended to focus on characteristics and practices which could be adopted in medical teams to reduce failure rates. What is missing from the current theory and research is an exploration into the connection between disruptions and the processes that allow high reliability teams to recover from disruptions. The literature on group development suggests a number of different kinds of disruptions in the forms of normal breakpoints, delays, faultlines, bifurcations, and cosmology episodes that vary in their intensity. While previous group

literature has identified the general classes of disruptions of group life, it has yet to stipulate the specific kinds of disruptions which may take place in the context of HRTs and how they disrupt sensemaking. This research explores the kinds of events which are capable of throwing a high reliability team into chaos and require immediate action for recovery. This line of reasoning leads to the first research question.

RQ1: What kinds of critical events disrupt the sensemaking and coordination in high reliability teams?

A relatively small amount of literature has been dedicated to the management strategies for dealing with critical disruptions within HRTs. The literature has tended to focus on the way that teams use strategies such as after action reviews after the occurrence of critical disruptions and does not explore how teams manage these disruptions as they are unfolding. Such an investigation may be important as certain teams may not be available for such post-event debriefings (Crichton, 2001; Weick, 1993a). Moreover, there are clear differences in the intensity level of disruptions; yet, we know relatively little how the severity of disruption may be associated with recovery strategies. This line of reasoning leads to the second research question.

RQ2: How do high reliability teams recover from critical events that disrupt their ability to make sense of and coordinate their activity?

A key hallmark of HRT is the ability to reflect and learn (Powley, 2009; Sutcliffe & Vogus, 2003; Weick, 1988, 1993a, 1998). Yet, few studies have examined the learning process and how HRT's develop knowledge for use in the future and how they

make use of that knowledge in subsequent activity. The third research question addresses this gap.

RQ3: How do high reliability teams learn from experiencing critical events that disrupt their ability to make sense of and coordinate their activity?

Perrow and Weick differ on whether HRO's can anticipate systemic failures. Shrivastva (2009) notes, "Perrow (1984) however, argues that it is pointless to talk about warning signals and possible interventions in hindsight. He asserts that it can be very difficult, if not impossible, to decipher the meaning of, and attend to, dozens of simultaneous signals against the background of noise and false alarms *before* an accident" (p. 1371). Weick would seem to argue that it is possible to anticipate the onset of critical disruptions. The fourth research question explores this difference between NAT and HRO theory inquiring into whether HRT's can anticipate crucial events.

RQ4: What facilitates high reliability teams' anticipating the onset of critical events?

Organization of the Dissertation

The remainder of the dissertation is organized chronologically paralleling how the research process unfolded. Chapter II outlines the research methodology associated with generating and analyzing the data. This chapter explains the rationale for selecting Special Weapons and Tactical (SWAT) teams as representative of high reliability teams. It also outlines the process used to collect organize and analyze data. Data from three separate SWAT teams were generated using an interview methodology and are subjected to a cross-comparative case study analysis. The analysis for each of the SWAT teams is

presented as an independent chapter (Chapters III, IV, and V). Chapter VI compares and contrasts emergent themes across the three cases and provides a discussion of key findings. Connections with existing research, additional theoretical contributions of the study, and avenues for future research are presented.

CHAPTER II

METHODOLOGY

A few studies have emerged recently which examine sensemaking and issues of reliability at the organizational team level, with the primary focus on healthcare teams (Baker et al., 2006; Benn et al., 2007; C. S. Burke et al., 2005; Riley et al., 2010). This line of research creates an interesting opportunity for understanding the sensemaking process and how it is connected to resilience and reliability within action teams. Action teams are highly skilled specialist teams who cooperate during brief performance events requiring the highest levels of reliability and often requiring improvisation to overcome unpredictable circumstances (McKinney, J. R. Davis, & Smith, 2005). Of particular interest to me is the manner in which action teams assess and make sense of rapidly changing and highly variable situations and make decisions that allow them to avoid disaster and overcoming disruptions which they encounter during operations. By engaging members of action teams, we may then be able to understand their perspectives of the process of creating reliability and resilience.

I have chosen to use members of Special Weapons and Tactics teams from three law enforcement agencies in the southwestern United States for my study. Special Weapons and Tactics teams must function at extremely high levels of reliability or innocent people, or the officers themselves, may be subject to serious injury or death. In the sections which follow, I will give a brief background on paramilitary police teams and how they developed over time, detail the key participants in the case study, and

illustrate how I gained access to the teams for this study. Finally, I will present my data collection and analysis procedures.

Special Weapons and Tactics Teams

Special Weapons and Tactics (SWAT) teams constitute the sample for the study. SWAT teams represent HRTs as: (1) they routinely function in contexts where functional decision making and adaptation to irregularities are commonplace; (2) they are forced to function in intensely variable high tension situations with every operation requiring them to manage the unexpected or unpredictable behavior of suspects which they are attempting to subdue; and (3) they are forced to adapt to these unexpected events in the critical moment without the possibility of withdrawing from the operation (J. G. Clark, Jackson, Schaefer, & Sharpe, 2000; Compton, Demir, Oliva, & Boyce, 2009; Davidson, 1979; Kolman, 1982).

SWAT teams are units which are designed to take on exceptionally high risk infiltration, weapons, hostage, and counterterrorism operations that fall outside the operational parameters and training of the ordinary patrol officer. These operations may require advanced weaponry and equipment which are specially designed to deal with critical incidents arising out of highly variable situations, particularly those involving shooting suspects, suspects who are expected to escalate to violence, suspects with hostages, and suspects who possess explosives (Angell, 1971; J. G. Clark et al., 2000; Compton et al., 2009; Davidson, 1979; Fry & Berkes, 1983; Kraska & Cubellis, 1997).

SWAT teams were developed in the aftermath of the University of Texas sniper event in 1966 where Charles Whitman climbed the thirty-two story clock tower at the

university with a high powered rifle and opened fire on students and faculty on the campus below for over two hours (Davidson, 1979; Kolman, 1982). Whitman eventually killed fifteen people and wounded a total of forty-six in what was, at the time, the deadliest university shooting in United States history. Prior to the shooting, Whitman had killed both his mother and his wife and then proceeded to the clock tower with an arsenal of weaponry including two high-powered rifles and 700 rounds of ammunition. Due to his position and the massive firepower of the weapons in his possession, Whitman was able to hold officers at bay, and in the end, average citizens were forced to aid the police in returning fire on the tower with hunting rifles retrieved from their homes (J. G. Clark et al., 2000; Davidson, 1979; Fry & Berkes, 1983; Katz, 2005; Kolman, 1982; Kraska & Cubellis, 1997; Kraska & Kappeler, 1997; Waddington, 1999). After the shooting, police began to evaluate their potential for handling more advanced weaponry with traditional means and determined that current tactics and weaponry would prove inefficient against higher powered modern weaponry (Davidson, 1979; Kolman, 1982; J. J. Williams & Westall, 2003). Shortly after the University of Texas incident, the Los Angeles Police Department formed the first SWAT team, which received great notoriety when it was used successfully against the Black Panthers in 1969 and the Symbionese Liberation Army in 1973. In the years that followed law enforcement agencies across the country began the development of their own SWAT units based on the LAPD model (Davidson, 1979; Fry & Berkes, 1983; Katz, 2005; Kolman, 1982; Kraska & Paulsen, 1997; Waddington, 1999).

SWAT teams have often been the subject of scrutiny by the public and the academic community, with critics commenting that such paramilitary units constituted the militarization of American law enforcement (Fry & Berkes, 1983; Kraska & Cubellis, 1997; Kraska & Kappeler, 1997; J. J. Williams & Westall, 2003). This high level of scrutiny has necessitated that such teams strive for the highest levels of performance, professionalism, and reliability. The teams and their leadership recognize that any mistake made in the execution of their duties will be highly publicized and immediately criticized (Davidson, 1979; Kolman, 1982; Kraska & Cubellis, 1997; Kraska & Kappeler, 1997). This understanding necessitates the highest levels of precision and execution by these teams with the lowest possible tolerance for mistakes.

Due to the nature of their tasks, and the often limited amount of quality intelligence concerning the situations they will face, SWAT units often operate in highly variable environments which require adaptation during critical moments of execution. Furthermore, SWAT teams often intentionally create additional variability in their environment making use of tactics and tools to create chaos in order to gain an advantage over suspects (Davidson, 1979; Kolman, 1982). Additionally, the contexts of the missions undertaken by SWAT teams are often governed by tight temporal constraints which necessitate immediate action decisions and on the spot adaptation.

Consider, for example, a hostage situation faced by a SWAT unit. In such a situation, the team does not have the luxury of retiring to a quiet location if their intended plan requires alteration due to some unforeseen event, particularly once a suspect has been engaged; as such a retreat could prove disastrous for the hostages in

question and potentially disastrous for the officers involved. Retreating from the situation is not an option; therefore, the team must adapt their tactics quickly through a process of team and individual based improvisation to manage unpredictable anomalies and normalize operations without significant delay.

My goal in this study is to determine: (1) what events precipitate the need for SWAT teams adapt to critical disruptions, (2) the nature of those adaptations and decision making in the critical moment, (3) how teams communicate to facilitate adaptation of the team through a process of learning, and (4) how teams subsequently use those experiences to anticipate suspect's actions during future operations.

Sampling

To gain access to SWAT teams, I contacted the Criminal Justice Department at Sam Houston State University. As an educational and research facility with a strong history of excellence in scholarship, Sam Houston State University provided an excellent opportunity to gain access through their network of contacts within police departments across Texas and the United States. A formal research presentation was given to the faculty detailing the nature of my research, and at the conclusion of that presentation I began working closely with the administration and the research coordinators at the department in order to secure access to SWAT teams. The administrators at in criminal justice education program made initial contact with the departments on my behalf and asked if they would be willing to participate. Departments which indicated that they would be willing to take part in the study were then forwarded on to me by Sam Houston State University with corresponding contact information. I then contacted each of the

SWAT Commanders independently via email or phone and arranged for times which were mutually convenient to conduct the study. The departments themselves represented three separate cities in central and south Texas. Due to the nature of their operations and the sensitivity of information presented in the following results sections, a decision was made to not provide the identity of the individual departments.

I used purposive sampling techniques to recruit participants for interviews. Purposive sampling selects participants on the basis of specific characteristics (Lindlof & Taylor, 2002). Participants were selected based on tenure on the department. This choice was made in order to ensure a variety of responses across experiential levels and ensure the greatest variety of perspectives on questions asked during the interview process (Creswell, 2009; N. Fielding & J. Fielding, 1983; Frey, Botan, & Kreps, 2000; Jick, 1983; Seale, 1999). Commanders of units were asked at the time of contact to begin to set up interviews with available officers on the team including those with supervisory roles. This type of purposive sample was important for generating a broad array of accounts applicable to officer's experiences as the officers had a broad array of experiences to draw from over varied experiential levels.

Participants

While the size of the departments varied somewhat across the cases, the size of the SWAT teams themselves were relatively similar with an average of 20 officers for operations. This does not imply that the maximum number of officers is used for every operation; rather determinations are made on a case-by-case basis concerning what officers will be used and how many are needed. The primary responsibilities for each

SWAT unit involved dealing with situations which were deemed to be too specialized or too dangerous for standard parole officers. These situations consist of high-risk warrants, barricaded subjects with or without hostages, suicide attempts, and acts of terrorism.

Upon interacting with the three SWAT teams for this study, I recognized notable differences in the structure of the teams. The cases used in this study represent three distinct organizational structures: (1) a part-time unit in which officers functioned in various roles throughout the department and came together as a SWAT unit when called upon referred to here as Alpha Team, (2) a hybrid unit in which some officers were full-time SWAT members and other officers performed other functions in the department unless called upon to function with SWAT referred to here as Bravo Team, and (3) a full-time dedicated unit in which the members functioned as SWAT members at all times, Charlie Team.

Alpha Team is located in a city with a population of approximately 250,000 people. The team itself was once full-time, but due to budgetary issues has been reduced in force and is now a part-time unit. The unit currently has twenty-one active officers of which six were selected for interviews. The six selected officers were chosen based on availability of officers and the researcher and with consideration of their tenure on the team itself. The team has been in existence since the mid 1980's.

Bravo Team comes from the largest city studied with a population of more than 1.3 million people. The team is a hybrid team with both part-time and full-time SWAT members. Eleven members of the twenty-member team were interviewed six of which

were full-time officers and five of which were part-time. Officers were chosen for interview based on their availability and tenure on the team itself. The team, in existence since the mid 1980's, is one of the most highly decorated in the history of SWAT with several world titles to their credit.

Charlie Team operates in a city of 790,000 people. Eleven members of this full-time unit of twenty team members were interviewed based on availability of the officers during the period of research and their tenure on the team. The team had been reconstituted in the late 1990's resulting in the current team used in the study.

Interviews

Due to the exploratory nature of this study, semi-structured qualitative interviews were conducted with SWAT team officers to determine how team members experienced critical disruptions and how they adapted to them. Lindlof and Taylor (2002) observe qualitative interviews are useful in gaining an understanding of the participant's experience and perspective particularly as these apply to the context and intentionality. This type of interview is open to the emergence of new information during the interview which was not expected by the researcher and allows the interviewer to adapt to that information quickly and flesh out additional information by asking follow-up questions (Lindlof & Taylor, 2002). By allowing the researcher the freedom to adapt and probe answers given by the respondent, the researcher is able to collect data that is particularly rich allowing a more detailed and complete account of the events described by the respondent (Creswell, 2007).

A semi-structured interview guide (Appendix A) provided a loose structure to guide my inquiry during the interview process. The interview guide covered the following five topical areas: (1) the respondent's team experiences and perceptions of successful operations, (2) types of mistakes that the officer has witnessed and jolts that the officer has experienced, (3) the process of adaptation in the moment, (4) learning from experiences as related to operational change and anticipation of future events, (5) and training of officers to deal with disruptions.

Interviews were conducted in private offices within the departments where the participants normally worked. All of the participants were assured of confidentiality prior to the interview and all applicable consent forms provided by the Institutional Review Board at Texas A&M University were signed (see Appendix B). Prior to beginning the interview, I outlined the interview process and informed the participant that they could withdraw participation at any point during the interview. Furthermore, I explained that refusing to participate or discontinuing participation would have no ill effects on their relationship with the Communication Department at Texas A&M University specifically or Texas A&M University more generally. All interviews were conducted face- to-face, tape recorded, and transcribed. During the interview process, I made notations on legal pads in order to construct follow up questions and allow the participant the opportunity to expand on their thought processes and elaborate further on answers. Interviews varied in length lasting from 35-90 minutes with the average interview taking approximately 60 minutes.

I encouraged interviewees to detail stories related to sensemaking, resilience, and decision making undertaken during SWAT team operations. In particular, I was concerned with detailing the processes associated with sensemaking during critical moments and the process of team members finding their way forward without withdrawing from the operation. I often made use of open-ended questions which presented an opportunity for elaboration and gave the respondent the greatest opportunity to detail how they personally engaged in SWAT operations.

After the interviews were completed, I made audio notations (speaking into a recorder) and written notes in order to debrief myself after each interview experience. These processes allowed me to identify ideas, concepts, and themes that I thought were beginning to emerge during each group of interviews and to identify areas where I could adapt and improve the interview process for future interviews. This process allowed for constant comparison and hypothesizing even as data began to emerge and, along with the eventual three-part coding process and cross comparison of cases, aided in maintaining reflexivity throughout the analysis process (Aron, 2000; Burck, 2005; Handler & Saxton, 1988; P. Johnson, Duberley, Close, & Cassell, 1999; Koch & Harrington, 1998). Engaging in this kind of reflexive process after the interviews proved particularly effective in identifying repetitive response categories which needed to be probed further in additional interviews. In most of my areas of interest, I began to notice saturation via repetitive response types very quickly. After completing all of the interviews and reviewing my field notes, it appeared that saturation was achieved

(Breitmayer, Ayres, & Knafl, 1993; Creswell, 2009; Lindlof & Taylor, 2002; H. S. Wilson & Hutchinson, 1991).

Transcription

I had all of the interviews transcribed by a professional transcriptionist service. Upon receipt of the transcripts, I performed a detailed analysis of each one by reviewing my own field notations and the recording and filling in any missed words or errors to create an accurate account of the interview. During this process, I began recognize the emergence of repetitive themes which I noted for later reflection and analysis.

Data Analysis

The interview data was analyzed using thematic analysis to identify commonalities in responses and emergent themes to address the research questions (Gummeson, 1991). This analysis took place independently for the three cases. In the following two sections, I will give a brief overview of the coding process and thematic analysis for each case I used as well as the comparative case method for comparing and contrasting the individual analyses for each case.

Case Thematic Analysis and Coding Process

Thematic analysis proved valuable in determining the common threads within the accounts of officers. This type of analysis was particularly suited to this research project given its exploratory nature.

To identify emergent themes from within the data set, the following coding protocol was used. First, I began with a single interview and performed open coding. Second, after independently coding each interview, I compared the various codes across

interviews for the entire case and refined and consolidated codes. This process involved both the individual researcher and, on a sampling of the interviews, another colleague who coded the information independently. The two coders then compared results in order to determine emergent themes from the data set. Third, I conducted axial coding where I attempted to group the smaller sub-categories into larger "meta-categories". After completing axial coding of a case (e.g., Alpha Team), I then wrote up the analysis for that case. I then repeated the process of coding and analysis for the next two cases.

Comparative Case Analysis Method

I then did a cross comparison analysis of the data from each of the cases to determine emergent themes across cases. This process involved analysis of emergent themes applicable to each research question across cases and then determining which themes were applicable to more than one of the individual case studies.

The comparative case method provides a way in which qualitative research from multiple organizations can be compared and contrasted through a process of individual case analysis and then subsequent comparison of findings across studies (Fox-Wolfgramm, 1997; Perrow, 1967; Yin, 2009). Yin (2009) notes distinct applications for the process including explanation of causal links in organizational processes which may be too complex to be discovered through traditional survey or experimental design methods. This is particularly applicable for exploratory research as it provides multiple teams to draw information from which should lead to more complete explanation of phenomena. Yin goes on to note that the use of the comparative case method also allows the researcher to situate the research, and in particular the narratives which are recorded,

in the real-world context in which events actually took place. The opportunity to situate the accounts of officers within the particular contexts that those accounts took place allows for the researcher to identify structural and organizational differences in the way that the individual teams are constituted which may account for variance in accounts between the cases. By attempting to account for such differences, this type of case comparison should allow for more complex and detailed description of the themes characterizing a particular phenomenon.

CHAPTER III

ALPHA TEAM

The Alpha SWAT team is organized according to a part-time SWAT structure where officers normally perform other duties outside of their SWAT role for the department in question and report for their SWAT duties only when called. This particular team had changed from a full-time to a part-time SWAT model in the last decade and many of the officers who were interviewed were part of the team under both models. Officers would occasionally reference the full-time model structure used in the past when talking about the team. The duties of the team include high risk warrant execution, hostage situations, suicide attempts, and any other duties for which standard patrol officers are deemed unprepared or ill-equipped. To organize the results section for this case, I will address each of the research questions presented in Chapter I and provide relevant examples of emergent themes for each research question.

RQ1: What kinds of critical events disrupt sensemaking and coordination in high reliability teams?

Officers noted two broad categories of critical events that disrupted sensemaking and coordination: (1) when a suspect did something unexpected, or (2) when an officer in the raid did something unexpected. Though assault tactics are designed to tip the scale of the engagement in favor of the officers, suspects' behaviors and actions when raiding a structure were often described as only mildly predictable due to a lack of complete intelligence regarding the suspect and location prior to assault, the rapid pace

at which assaults take place, and variability in the way that each individual suspect reacts when encountering law enforcement. Officers reported that, even with the best preparation and knowledge, it was impossible to fully predict what human suspects might do when confronted with law enforcement.

Officers noted that going into an engagement with strong pre-existing expectations often led to errors in predicting what a suspect would do. For example, one officer recounted a situation in which he was called to work with a suicide attempt. Such a situation is emergent and does not allow for preparation or the prior gathering of intelligence on the suspect which limits the officers' ability to anticipate what the suspect may do. However, officers did report that they associated a certain expected pattern of behavior with announced suicides. Specifically, officers noted that most people who announce to law enforcement their intent to kill themselves do not complete the act. When officers are called to a suicide attempt, they have a preconceived notion that, unless the suspect has a hostage, that their intent is to direct violence on themselves and not others, including law enforcement. Using these preconceived expectations as a guide to make sense of an emerging announced suicide can aid officers in making sense of the situation that they face and anticipating what moves the suspect is likely to make during the encounter.

Nonetheless, gaps in the overall understanding of the suspect and the situation may arise despite the officers' previous experience and what first-hand intelligence can be drawn from the scene. These gaps in understanding create opportunities for officers to be surprised and have their sensemaking disrupted. Consider the following example:

> When I first arrived and I heard the *pop*, the first shot, I thought, "Okay, he shot himself. It's done now." So I'm behind a tree, close to the window, where the window's maybe four feet away from me, and I'm sitting behind, _____ sitting behind a van, and *pow*, another shot comes out, hits the trees right that's sitting next to me, so he's shooting outside. I say, "Oh".
>
> So what happened in a nutshell is that night he shot out of the house a couple times, he shot at the cop cars a couple of times that are parked across, at an adjacent angle, he then comes out of the house with this big Dirty Harry (a 44 magnum) and he's walking out. So right there, given the circumstances of shots being fired, people had to get behind cop cars, where he shot the cop cars. We had enough right there to go ahead and execute deadly force.
>
> So he comes out and then eventually he's walking in the street. No one's shooting at him. No one kills him, no one takes him out… the whole premise behind it is that it's a suicide, a guy who has threatened to commit suicide, so they're arriving with the thought, the preconditioned thought, "This is a suicide. Let's try to talk him down." So this guy's walking around with a gun to his head, walking around, following – police officers are backing off of him, walking around a car.
>
> So their mind's preconditioned this is a suicide, "Drop the gun. Drop the" – they're trying to talk him to drop the gun after he's already shot at a cop car, shot at me and my partner over by the window. And now how I knew this is over the radio comes out that one of the K-9 guys says, "I got a clean shot," but he's waiting for the command to do it. So that means – the police officers precondition themselves to think, "This is a suicide; we don't want to hurt the guy."
>
> So that's the surprise – surprised me that it took a while, but finally someone did and took him out, end of story.

As the officer describes, officers arrived to an announced suicide attempt with the impression that they were there to prevent a suicide. However, unlike most suicide attempts in which the suspect's direct violence at themselves, this suspect goes on the offensive and surprises the officers. The surprise in this case results from the officers having such a strong preconceived expectation that they are there to help "save" the

suspect that they overlook opportunities to stop the suspect from shooting at them. In this case, the suicide attempt escalates to the point where officers must use deadly force against the subject or what is referred to as “suicide by cop.”

The second category of critical events which disrupt sensemaking occur when officers take unexpected actions during operational and training activities. Officers noted that when their colleagues acted in unplanned or unexpected ways this disrupted the flow of sensemaking and produced the need for adaptation during the mission. A particularly disruptive critical event occurred when officers deviated from tactical norms such as waiting to enter a room until they had another officer covering them. When these types of events took place, they felt that they could not go forward with the mission without violating the norms of tactical procedure. While officers trained for this type of eventuality, there appeared to be a sense of confusion about what to do when an officer broke protocol.

One officer recounted a critical event regarding breaks in protocol which involved entering a structure where he lost track of his partner. In this case, the respondent’s partner continued forward into the structure without backup. The respondent officer had become indisposed while dealing with another occupant in the structure, and his partner had mistakenly gone on without him. Once the occupant had been subdued, the officer then moved forward in the house only to find his partner waiting to enter an adjacent room. The respondent noted that his partner had become disoriented due to the fact that his backup (the respondent) had fallen behind, and this had slowed his progress to a stop. This episode shows the value of working within

existing team expectations and the resulting confusion in the sensemaking process which manifests when there is a break in expected team member behavior. When team members break from protocol, other members can become so disoriented that their progress is terminated and this break in progression is something officers try to avoid at all costs.

Some officers did equate breaks in entry protocol with experience and training deficits. Officers specifically noted that new officers were not being trained on the importance of staying with their partner at all costs during entry. As newer officers were not having the value of staying with a partner instilled as a fundamental operational principle, older officers noted that it resulted in difficulties in maintaining expected norms of conduct during operations. A senior officer, when reflecting on younger members of the team, noted the importance of "staying with your wingman" and not breaking from your assigned role during an assault. The officer noted:

> The only thing that really pisses me off is if they break off and go somewhere else. Then somebody's ass is gonna get chewed out. Because that was real big whenever I started, you know? Hell I ran Number 2 (the second person entering the structure) forever, you know? It was the point, the Number 1 guy and I ran Number 2, I went wherever he went, you know, and then I was the pitcher, where I threw in the flash bang but I did that as Number 2 because we hadda smaller amount of people but, I mean, you did – that was your thing, you never left the wingman and then, somewhere along the line, we got away from preachin' that and I just think it's detrimental to it because you can do a whole lot if in other words, you know your partner's always with you.

Officer deviation from plans and procedure may not be fully accounted for until the after action review process, yet officers are often forced to deal with such events as they unfold during the operation itself. While SWAT officers often pride themselves on

their ability to adapt to an ever changing environment, unexpected moves by suspects and teammates which are not immediately understood in the heat of the moment are often a cause for some confusion and create the need for adaptation.

RQ2: How do high reliability teams recover from critical events that disrupt their ability to make sense of and coordinate their activity?

Officers often reported falling back on their training and previous operational experiences to deal with highly variable situations. Officers reported drawing on that training and experience to make immediate action decisions during operations. As part of that training certain jargon has become standardized among team members. An example of such jargon which is closely connected to the immediate action decision making process can be found in one of the repetitive phrases used by Alpha Team SWAT members, the concept of the OODA Loop.

The term OODA Loop is an acronym representing the decision making model created by Col. John Boyd of the United States Air Force during the Korean War. The acronym itself, OODA, represents four actions: (1) observe, (2) orient, (3) decide, and (4) act. The OODA Loop, shown in Figure 1, presumes that the processes of observation, orientation, decision, and action do not necessarily unfold in a linear manner. Rather, the OODA Loop is a set of processes in continuous interaction with orientation—how we interpret the situation via our culture, training, previous experiences, and informational analysis—always at the center of the process (D. Clark, 2010).

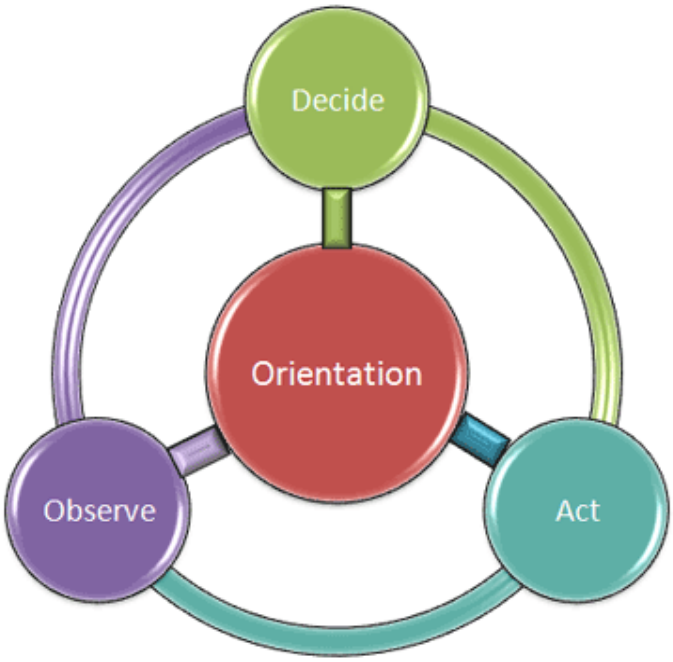

Figure 1. OODA Loop

SWAT officers reported being trained using the OODA Loop to help them understand their immediate action decision making processes and to understand the decision making processes of suspects during operational activity. Officers reported continuously training and using contingency thinking to gain experience and shorten their own OODA Loop process, thus decreasing the amount of time necessary to observe behavior, orient oneself to that behavior, make a decision, and then act upon that decision. In the following example, the responding officer notes how the use of contingency thinking allows for shortening of the OODA Loop process and allows for an almost instinctual reaction to suspect movements during operations. This connection between activities which hasten the OODA Loop process and decision making allow the officer to react rapidly and appropriately without hesitation:

> I mean we're constantly thinking about it, we're constantly thinking tactics, you know, our – when – when a woman asks you what's on your mind because you've been quiet, you know, your typical response is, "Ahh, nothin'," because you don't wanna tell her what's on your mind and what's on your mind is your own little world. Well, our own little world is that, we're runnin' scenarios through our head, you know, the – we're thinking about it a lot, we're planning it out a lot, we're visualizing, on a regular basis, makin' – making those entries and putting ourselves in a bad situation in our mind, not because we wanna be in the bad situation but because we wanna survive the bad situation. So when – when you come in to the entry, you have run this scenario so often, you – when it happens, hopefully your body's already reactin', you muscles, your mind are already reacting to that situation that, in your mind, you've already been in… but you try to plan out that scenario where you kick the door and there's a guy on the other side with the gun. The more times you do it, the more times you see it, you know, and you become more comfortable. I've seen – I've been a breacher and breached a door and hadda guy five feet from me with a gun in his hand, you know, and I've got no weapon in my hand but the breacher, the breach tool and – and so you – you develop at – a sense of what the normal reaction is because of this repetition that you have.

An interesting aspect of the decision making process is that many officers reported that it was preconscious, they did not believe that they had time to think prior to making decisions. This forced officers to react in the critical moment and make immediate action decisions derived from a much shortened OODA Loop process. Officers often reported not consciously thinking of what to do as much as they instinctually reacted to the situations that they faced while drawing on training and previous operational experiences to find their way forward and rapidly make sense of the situation. Officers often made statements such as, "I think you're on automatic pilot, to be honest with you. I think it's like an angel on our shoulders many times. I think we're sometimes just plain lucky." Another officer reported:

> From my experience, it's not a thought process. It's a response, a reaction to what your perception is. I understand how officers get hurt, because

> they perceive things. There's a video of an officer getting a call on some guy walking across a bridge. You see on this video that he pulls up, and the guy's walking on this bridge. It's a large city, I think in the west. He starts communicating with the guy. Well initially, the guy is noncompliant, but then the officer gets more forceful so the guy is compliant, limitedly. As the officer closes that distance on the guy, he is reluctantly complying with the officer's commands…Once they get closer together, the guy attacks the officer, and they're in this long struggle. The guy bites his ear off and it was a pretty intense physical struggle between the two guys, and the officer finally shoots the guy to get him off of him.
>
> My point is, I think we perceive things, and we react to them without actually stopping and thinking, "This guy is compliant, but he's not doing it freely. Is he trying to sucker me in?" After looking at it, it looked like the guy basically allowed the officer get close enough to him so he could launch an assault on the officer.
>
> I think when we're moving in motion, and things start happening, we just react. It's whatever our instinct tells us to do. It's through our training that we're going to act the way we're trained.

In order to prevent hesitation and promote fluid reaction and decision making officers repeatedly reported being trained to “keep moving forward” or “look for work” rather than simply standing in the middle of a room in shock which would impede the progress of officers who would be entering the room after you. Officers consistently reported that “doing something is better than doing nothing”, and that even in the face of adversity that “trying something” was better than freezing up. One officer, when faced with a question of what to do during a critical incident recalled, “I mean on SWAT, after all the things we’ve been through, is when it happens, you just do something. The worst thing you could do is do nothing, and that’s always kind of been my deal, if my partner has got hands on somebody, I’m gonna get hands on somebody. If something goes bad, I’m gonna (do something).”

Officers reported such dedication to the concept of continuously moving forward that even in the most ambiguous, and in some cases dangerous, situations they would continue to do so. For example, one officer recounted an assault in which he was shot by a suspect, yet continued to move forward and complete the mission.

> It was a nighttime execution. We had information, and I remember the case agent saying, "The information from the informant is that this guy's crazy, and he always has guns on him." In our situation, we hear that frequently. In the briefings prior to running these warrants, because of the type of people we're dealing with, you hear that frequently. You know, "The guy says he always has a gun in his waistband or he always has a gun nearby." Even though now I distinctly remember the case agent telling us that information, at the time, we hear that so much, it was something you kind of tuck away and it didn't mean quite as much then as it did afterwards.
>
> We made our approach from the back. It was dark. We're kind of sneaking up the driveway, and everything is going just as we planned up until that point.
>
> I remember as we rounded the corner of the back of the house, this motion light came on. Instantly, your adrenaline jumps because you're not thinking about it being a motion light, you're thinking somebody just flipped the light on and they know we're here.
>
> So we kind of stepped up our pace at that point. Looking back on it now, I don't think they were even aware we were out there. I think it was a motion light, and it just clicked on. I remember personally my concern going up.
>
> We get to the back door, and there's a storm door. We pull the storm door open. The breacher hits the back door, and this was one of those doors that's half glass and half wood. Well, when the breacher hits that back door, it basically falls apart. Here again, I think he was like I was with that light coming on and stepping up our pace a little bit to get to the breech point, he hit that door with a lot of force, and it just basically came apart. That made a lot of noise, and at that point we deployed a flashbang into the back of the house. The flashbang goes off. You could go in through the smoke of the flashbang, and I broke to the right. There was a hallway that went toward the main portion of the house, and I broke to the right. I remember hearing a muffled *pop, pop, pop* as I entered the door,

> but it was muffled. I knew it was gunshots because you just know, but I couldn't distinguish where in the house it was coming from.
>
> I continued on through the kitchen and confronted the suspect. There was a bedroom that kind of came out off the dining room and living room part, and that's when we exchanged gunfire. He retreated back into the bedroom. I continued on to the bedroom door, and we exchanged gunfire again, and that's when he went down.
>
> I was hit once in the vest with no injury. It didn't really change my thought process. I was actually hit on the initial exchange when he appeared out of the doorway, and that was one of those things as a young SWAT officer, I don't really know I was as prepared as I should have been. I remember seeing him, and I remember seeing the muzzle flash. It just seemed like it took me forever to respond, and by the time I brought my weapon up to respond, he ducked back into the bedroom.

Another officer further expanded on the idea of reaching a point of no return in operations in which the team felt an obligation to continue moving forward:

> …once we're already in that motion of making the entry, when you have half the team in the house and half the team is outside the door, our decision at that point is that we're not gonna leave half our team in the house. In other words, if we're all the way in or part of the way in, we're gonna keep going because we don't want half the team to back out, leaving half the team in the house. Then you don't have enough personnel to safely control the situation….
>
> So our deal is we're gonna get our guy, and we're gonna get him out. We're gonna have to neutralize the threat and extract our people out. Our biggest fear is two guys going through the door and getting hit and falling down, and the rest of the team backs out of the house, and now we've got two guys hit and in the house with the bad guy.

Once the operation has begun and officers have entered the house, the operation is in progress and officers cannot abandon the operation in the event of a critical incident. Rather, officers are forced to continue to move ahead and manage the critical incident.

RQ3: How do high reliability teams learn from experiencing critical events that disrupt their ability to make sense of and coordinate their activity?

Officers repeatedly remarked that the most valuable learning is done through experience, training or operational, in which new experiences are encountered. Officers were somewhat reluctant to admit that they had been surprised by variability in training or operations, yet reported that such events often led to learning opportunities.

An important factor that influences the way Alpha SWAT team learns and processes their experience stems from the fact that the team is not a full-time dedicated unit. Upon completing a mission, the team disbands and the officers return to the other roles they have within the department. This model is becoming more prevalent for SWAT units across the country. One officer explained that even the much storied Los Angeles Police Department (LAPD) SWAT unit now operates in this fashion:

> I know some guys who are on LA, and I talk to them. They basically do what we do. They go load up in a car and work Hollywood division. They have the flexibility to kind of float around and deal with problems.
>
> It's not like the old SWAT show where they're sitting in the basement lifting weights all day and they have the pole they slide down like the fireman. They're actually out in the field knocking off the street dealers and stuff like that. Then when they need to come together as a SWAT team and go save the world, that's what they do.

Due to the officers having other duties beyond their SWAT responsibilities, the officers have little time for formal debriefing sessions with each other where they may return to their headquarters and spend significant amounts of time going over the events of the mission. In contrast to a full-time team, supervisors in Alpha team were reported as walking around the assault scene shortly after the operation was completed and making

efforts to speak to every officer who was involved in the mission before the officers returned to their other roles in the department. This practice allowed supervisors to get a feel for "what went right and what went wrong" in the operation. Supervisors repeatedly noted that these informal debriefing sessions often provided critical information about training deficiencies which led to the alteration of subsequent training programs.

It appears that the after action reviews, or debriefing sessions as they are more commonly known by SWAT members, allow supervising officers to question officers about what they witnessed from their particular vantage point as the mission unfolded. Gathering this intelligence gives supervising officers an understanding of what aspects of the assault were effective and ineffective and helps the supervisors identify areas where additional training and tactical development are necessary for the team as a whole or for particular individuals. By identifying areas for team and individual level improvement, the continuous improvement of the team can be brought about. Describing the debriefing session, one supervisor noted:

> A lot of times, the debrief is just right there at the scene, after we get through, because we have to stand around for security while drug enforcement is searching the house. We're just kind of doing a perimeter there to make sure nobody comes up, or if there's people we need to watch, because there may be bad guys living next door, too, that we don't have a warrant for.
>
> So, what the sergeant will usually do is he'll ask each one, "What do you think about the mission? Did you see any issues we need to work with, or anything like that?" If there are some issues, then we'll bring them up to him. The next training day, we'll bring them up as, "Let's make a decision on this."

Another officer, when reflecting on the current informal debriefing process and the connection to future training events noted:

> But now here a lot of times we, before, I know before I left we do it in the front yard or the backyard. We'd kind of walk around, the senior team leaders or the sergeants, "Hey, what happened with y'all? Who'd you have? What'd you have?" We had to do kind of a roving mobile debrief because time constraints and everything else. They still talk about it, and, you know, if it's something really bad it'll be brought up the next training day, which is usually a following Thursday. They always have training days on Thursday. It'll be the following Thursday, we'll say, "Hey, we want to talk about the search warrant last week," or "We want to talk about the search warrant yesterday." You know, "What happened? This is what we saw happen. What can we do to make it better? What can we do to change it?"

Officers noted that debriefing is perhaps the team's greatest opportunity to learn from their actions. Officers observed that this was particularly applicable at times when mistakes occurred or when events failed to take place as planned. Of particular interest was the link officers made between "trying out" tactics, which had been rehearsed in training during operations, and then assessing their effectiveness after they were used in an operation. Officers linked this process with determining what worked and what did not. One officer remarked:

> Okay, if something goes wrong, that's where we learn. We learn more at what happens wrong out there than what we do in training, because we can train in a static situation and say, "Oh yeah, this is gonna be good." We do it this way, it's wonderful, and then all of a sudden we do it in the real deal and then go, "Oh, wow. We didn't think about that. I didn't know this guy was gonna come out of here."

Officers also noted that personal accountability for actions during debriefing situations was very important to continued learning. During the debriefing process, officers often recounted the value of having accountability within the group, particularly when someone had not performed optimally. Interestingly, even in situations where tempers flared, there was a sense of mutual respect for other officers as long as they

admitted fault when it was applicable. Due to the fact that errors were noted as a way that officers learned and improved, officers deemed it essential for each officer to give an accurate account of their part of the mission even if egos were bruised in the process.

> Sometimes people got their feelings hurt because, you know, if they were supposed to go right and went left, "Why'd you do that?" You know, but we debriefed it, we talked about it, and we did it on a professional level; it wasn't a name-calling finger-pointing type deal. You do a debrief, see what you can improve on the next time.

Another supervisor noted that if the officer involved in the mistake took responsibility for their actions that it altered the way that he conducted corrective activities for improvement:

> I like to address it then, you know, and see what their response is. A lotta guys are real good about, yeah, you know, I effed up and did this or that, you know, and then I ask 'em, you know, why'd they do it, ya know, and – and I try to go into teacher mode then versus asshole mode.

While there appears to be a common thread of respect between officers when addressing errors or the inability to react to perceived unexpected events during operations and training, some officers did note that there was a need for persons identified as causing the problem to "step up" and take responsibility for their actions. Officers repeatedly noted that when an error was identified, attempting to deflect blame was not tolerated. Officers noted that overall team performance was impaired if people refused to continue to learn, particularly from errors and adaptations to events which were unplanned. One officer, when reflecting on individuals who attempted to deflect responsibility after such events noted:

> I get a little frustrated when I see something happen that I am just, "What are you thinking?" type thing, which sometimes happens. I'm sure people think the same thing about me, too. I make mistakes just like

> everybody else. But he'll (the supervisor) go around and talk about, "Is there anything we need to look at?" If there's something we see, we're vocal, we're honest, we're open; it's not trying to throw a rock at you, but let's make a decision, "Was this right or wrong, and if it was wrong, how do we need to do it better next time?" It's not about the man that made the mistake, it's about, "Okay, why did it happen, and do you understand why it was wrong?" If you have somebody that says, "Well," you know, kind of blows it off and stuff, that's the first mistake.

RQ4: What facilitates high reliability teams' anticipating the onset of critical events?

Four broad categories emerged from the analysis regarding factors or practices that enable officers to anticipate critical events: (1) situational variable assessment, (2) mental preparation including mental rehearsal and developing a "warrior" mindset, (3) training and simulation, and, (4) previous operational experience.

Situational Variable Assessment

Situational variable assessments enable SWAT members to control the environment in which the raid will take place. Officers place a high priority on gaining rapid control of the environment in order to contain suspects and limit their options. This requires them to identify and gain control of the situational variables which have the potential to cause the officers harm. The process of gaining control of variables that can affect SWAT operations begins with determining what variables may delay or disrupt the team's processes during the assault. These include physical barriers to the assault, such as the type of locking mechanism used on the door of the structure, as well as human and animal barriers such as the presence of trained attack dogs. Officers report that the most accurate method of assessment is first-hand intelligence. Firsthand intelligence consists of information applicable to the mission which is collected by members of the SWAT team and was therefore considered more reliable than

secondhand intelligence. Secondhand intelligence is applicable mission information collected from any source outside of SWAT including criminal informants or officers from divisions outside of SWAT; however, it is usually viewed with a great deal of skepticism.

Officers reported that the perceived necessity for firsthand intelligence was derived from the fear of making errors based on secondhand intelligence. The errors associated with secondhand intelligence at times altered SWAT team policies and protocols. For example, in one situation SWAT officers trusted another officer outside of SWAT to provide the exact location that was authorized for assault and entry by the warrant:

> …the simple fact is we used to rely on the sergeant to go look at the house or we'd rely on the narcotics agent to tell us, "Hey, that's the house." And this one we went in blind. I was told, "The narcotics agent is going to be standing in the front yard and he's going to tell you which house it is." Fine. I jump out of the van, and Sergeant ****, I think you probably met this morning, is my partner. We jump out of the van, there's three identical houses, three identical duplexes. I'm going, "Which one?" There's one of our narcotics agents standing in the front yard, guarding in front of this house. That's got to be it; nobody's given us a signal. Thank goodness the old man had passed away the week before and the house was empty, 'cause we flash-banged it and we tore the door off the hinges. The whole time the bad guys are next door, looking at us, watching us, "What are they doing?"
>
> So we revamped all of our programs after that. And we then, with the surveillance, the narcotics people or the detectives would give us, the lead officer; the primary point man would go with them and get an eyeball on the house.

After this incident, the team changed their preparation policy to include a drive by, if possible with photography, by at least two supervising SWAT officers for the raid and the lead detective who initially obtained the warrant. This policy change provided the

officers firsthand intelligence and the confidence of seeing the raid location in advance with the detective in charge to verify what location is the subject of the warrant. The presence of two SWAT officers for the drive by also aided later stages of the planning process, in particular the determination of variables which may cause delays during the initial entry as well as throughout the assault and the methods which could be used to overcome those barriers or obstacles. One officer explained:

> So we'd do that, we'd get all our intelligence together on what house we're going to do, what's it look like, what are its strengths, what are its weaknesses, where can we go in easy. You always want to try to go in where everybody else is going in; the last place that's going to be booby-trapped, the last place that's going to have a lot of locks, because that's the one they're going in and out of. If you go anywhere else you're going to have to be defeating the structure, you know, as well as the people inside.

Assessing situational variables does not rely entirely on the firsthand observation and assessment of a location by the supervising officers. The officers also reported that they seek to gain as much intelligence as possible about the suspect and the location that the suspect occupies from any and all persons who are dealing with the case. This type of secondhand information gathering, particularly by those persons having a direct history of interaction with the suspect, provide information which allow officers to anticipate what the suspect may do during a given situation based on their previous interactions with the suspect and the suspect's criminal history. Officers learn to anticipate the moves of a suspect with which they have had limited or no previous interaction based on the assessment and intelligence gathering of other officers. For example, officers reported that if the detective on the case reported that a suspect was known to be armed at all times, they became much more alert to the presence and

display of weaponry during the resulting assault. By having information relevant to the criminal and behavioral history of assailants, the officers were able to better anticipate what moves the suspects were likely to make. As mentioned earlier, officers reported being skeptical of information from secondhand sources. They were particularly cautious of information that came from criminal informants with which the team had had little or no previous history. A pattern emerged of "trust but verify" with regard to information which was presented to officers by other informants outside of the team.

Officers reported planning to maintain a three-prong approach to assault: (1) speed, (2) surprise, and (3) violence of action. The idea behind the approach is to shock the suspect and dominate the structure as quickly as possible. The preparation officers engage in prior to the mission is dedicated to maintaining that three prong approach throughout the operation. Using a combination of firsthand and secondhand intelligence officers develop a plan to anticipate and overcome situational variables which could interrupt critical team processes. This process of anticipation and planning involves the selection of methods and tactics for the team assault on the property, equipment selection, and personnel selection for the mission. An emphasis was placed on determining situational variables which might hinder the entry process, and then determining ways in which those variables could be overcome or avoided. The heart of enacting high reliability organizing begins here as officers attempt to identify variables which may cause delay in the entry and apprehension process by reducing the speed of the team during entry and perhaps negatively impacting the element of surprise, two of the three essential elements officers identify as essential to controlling any highly

variable assault situation. In the planning stages, officers engage in this type of situational variable assessment in order to determine what could cause a delay and then determine a way around that potential delay in order to maintain speed and surprise. One officer while reflecting on variable assessment and how it impacted the raid planning process noted:

> …depending on the size of the structure that's going to be taken down, whether it be a house, a mobile home, an apartment, that would depend on how many officers we would use. A little motel room, six guys…we have to dominate with manpower. So what we would try to do is put two people per room in a structure, whether it be no matter, a hotel room, a two-story mansion, whatever; we would try to do that to dominate it quickly with manpower so that we didn't have any type of firefight or gunfight or anything erupt.
>
> So you'd figure out what size of structure you're dealing with. You'd pick your team, 6-man, 10-man, 20-man, whatever. And then you would take surveillance from whatever agency or whatever unit you were going to be doing this warrant for. Narcotics, you know, we didn't write our own search warrants on SWAT, when we were full-time SWAT, for the simple fact is we basically were farmed out to everybody; ATF, DEA, FBI, Marshal Service, our guys, Sheriff's office, Task Force. We did all the search warrants.
>
> So when we would get a request from these agencies or entities, we'd go sit down with their case agent, go over what they knew, get as much intelligence as possible. Then we have an operational plan that we devised. It dictates who's doing what, what weapons or equipment they're carrying, what their primary responsibilities are in the deal, and we would designate those things to those individual officers.

Noteworthy in this account is that the intelligence gathered dictates the type of approach used and the number of officers necessary to preserve reliability during the assault. Another officer, also reflecting on the process of decision making noted that intelligence gathered dictated decisions about every aspect of the approach and entry to

the structure all of which promoted maintaining the three pronged assault: speed, surprise, and violence of action. The officer noted:

> Depending on how we were going to hit the house, we would pick what vehicle. We have a big SWAT entry van, we call it the bread truck, or Bubba some guys call it. And then we have a couple of armored vehicles; we just got a new one. And then we had a little raid van, a little white Ford van we call Skippy, Skippy the Wonder Van, 'cause we always wonder if it's going to start to get us home.
>
> But anyway, we would pick whichever vehicle, and a lot of times we would pick something nonchalant. We've done them out of the back of garbage trucks, we've done them out of the back of dump trucks, we've done them out of city buses, pull up, hit the button, all the doors open and everybody piles out. It depends on your training and environment how you can sneak up on this house. We try to get as close as possible utilizing cover and all that of other houses, bushes, cars, whatever. Stop down the street, get out, get on foot, and work our way up to it.
>
> If not, we have to do what they call a Comanche raid, slide up out front, doors fly open, everybody runs for the house, you know, just like a bunch of wild Indians coming out. And it depends on what, you know, we would decide what car or vehicle we were going to use.

Mental Rehearsal and the "Warrior Mindset"

A second process that facilitated SWAT officers anticipating critical events centered on issues related to the mental preparation of the team by mentally rehearsing and mentally focusing by creating a "Warrior Mindset." One process that was used to mentally prepare the team was the creation of a shared mental model of the operation through rehearsal. Of particular concern to officers was making sure that the tactical decisions and intelligence information were not only heard by the officers who would be conducting the raid, but that they were commonly understood. Officers often noted the importance of making sure that "everyone is on the same page" or that "all facets of the mission were understood by everyone." This idea of having a common or shared mental

model was often associated with the confidence that "everyone had a common idea of the job that we were going to do", and is mentioned by several officers in conjunction with achieving "one mind". One officer noted:

> We hafta operate in one mind and when it's time – when it's time (to) happen, or when it's time to serve the warrant, when things are going like we rehearsed them in our mind, like we briefed, aside from a very overwhelming change you know we – we've done this so many times that we know how we're gonna operate and there usually isn't a need for us to – to give off too many directions at the time. We've worked out beforehand exactly how the breachers are gonna breach the door, where they're gonna stand, how the point – the first 2 point-and-cover teams are gonna cover the entry point and check the entry point, how they're gonna position themselves for the breachers to move up and breach the door, things of that nature.

Participation on pre-assault briefings was critical to establishing a shared mental model. One supervising officer outlined the importance of having all persons involved in the raid being present at relevant briefings so that a shared mental construct could be assured prior to execution.

> We brief the team, we brief everybody involved in the warrant all at one time. The only people that are not allowed to be on a warrant that isn't in the briefing are your surveillance people from Drug Enforcement. They're watchin' location. That way there's no mistaking who's there, who's gonna to be there, what they look like, what they're wearing, what they're supposed to do, everybody hears the same thing.
>
> The surveillance people who are out there for the briefing are only there for surveillance and do not approach until the structure's secured and turned over to Drug Enforcement by us, so that's vitally important to us. The briefing, we pick it up, we'll plan it out, I'll explain what the plan is to everyone, make sure all the questions are asked, everybody's comfortable with their row of equipment, is prepared and we'll get it.

The presence of all the officers that would be involved in the assault was critical so each person heard the same information and so that all questions were answered prior to the

mission. By achieving a common mental model of what each officer would do during the raid, the team members reduced the likelihood that officers would perform in unpredictable ways or would be shocked by the actions of other officers during operations.

While mental rehearsal provided a template for sensemaking and action, the development of the "Warrior" or "Survival Mindset" helped develop a clear mission focus and reinforced the criteria for making decisions in the moment. As officers rode to the assault site, they used this time to prepare and attain what they called the "Warrior Mindset" or "Survival Mindset." This mindset was predicated on the assumption that failure was not an option for the team or the individual officer and whatever was necessary for survival or success must be done. The key component of attaining this mindset was harnessing the survival instinct of officers and making mental preparations to do whatever was necessary to maintain the highest levels of reliability and success. Officers reported that doing whatever was necessary often involved them making peace with the worst case scenario that they were likely to face. As one officer noted, "Okay, I'm going to walk the worst-case scenario. If I have to kill somebody what's going to happen? I'm good with it. I'm good with it. I made peace with God, I made peace with my family, I'm good with it."

Supervising officers involved in training often reported that "training the warrior mindset" was an important part of officers' training as a member of the SWAT unit. The training episode was often a harsh lesson and reminder that the mindset must be attained prior to entering the operational arena.

> But mindset, you know, that's one of the things that I guess I'm kind of old school about it, I tell all the new kids at the range, all the rookies and all my new SWAT guys when I teach out there, the mindset – "You've chosen to be a police officer, you've chosen to be a warrior. Okay, you're not a meter maid, you're not a, you know, a security guard somewhere; you're a police officer. And especially if you come to the SWAT world, you may be at some time in your life asked to do something that the normal police officer doesn't want to do or hasn't done or can't do, and that's kill somebody." And I said, "You need to have that mindset that," and I tell them, I said, "If I have to kill – my mindset is if I have to kill everybody on this range to go home to my family tonight, sorry about y'all's bad luck," but that's the mindset they – I said, "That's the mindset y'all need to have too."
>
> You know, they all kind of looked at me, "Well, why would you hurt us? We ain't done nothing to you." "It's nothing personal, it's not about – but if I have to do this for me to survive and make it out of here alive, I will do this. You know, I have chosen that path in life." And that's just something that they can't get their minds around it, "Well I might have to hurt somebody sometime."

Achieving a clear mission focus and creating the "Warrior Mindset" involved eliminating personal distractions prior to engaging in the mission. Officers noted that this was particularly applicable to situations in which intra-team conflicts outside of the mission had emerged prior to the mission. Officers noted that it was important to leave any and all personal issues between officers outside of the operational arena in order to assure safety and to make sure that all members of the team were focused on the mission alone and nothing outside the mission parameter. By eliminating distractions, which could pull the focus of officers off of the tactics and procedures that they were to execute, officers assured that each member of the team was mentally focused and prepared to deal with the operation. The process of eliminating personal distractions resulting from intra-team conflicts manifested in a ritual experience that officers

reportedly engaged in prior to every mission experience. The officers referred to this ritual as "Burying the Bone". One officer described the experience saying:

> I tell myself this, I tell myself, "I'm going home to my family. I am not going to end up in a box. I'm not going to end up in the street somewhere, bleeding to death. I'm going home to my family." And, you know, and I'll – me and – we do a little deal, I don't know if they told you about Bury the Bone.
>
> It's a deal that we started years ago that the whole team, once we do the briefing, the whole team gets together, puts their hands in, and we yell "Bury the bone. Everybody in. Everybody out. How do you feel?" Bury the bone is if you and I are teammates and 30 minutes ago we had a dog-cussing fight that we disagreed about something, and I'm mad at you and you're mad at me. They call us up and go, "Okay, guys, we're fixing to hit this house. Gear up." You and me are teammates going in the door, okay? I'm burying the bone; I'm forgetting about that fight. We're partners now, and your life depends on me and mine depends on you, so we're burying that bone.
>
> Now we come out of that door and it's over and me and you are safe, I may cuss you again and tell you (that) you were wrong about that awhile ago, but I'll dig that bone back up after it's over.

Training

The third category associated with the anticipation of critical events was training. This category consisted of simulation experiences outside the operational arena which provided experiences for the officer to draw upon and compare with live events in the field. SWAT officers normally described training as a team process in which simulated experiences were used to place officers in "real world" situations where they must make decisions on the best way to proceed within mission parameters without error. These training sessions were subject to evaluation by supervisors and were often accompanied with a hands-on assessment designed to point out what went well and what did not. Officers were insistent on maintaining the most realistic and intense situations possible,

believing that training on the most hostile situations would prove beneficial for conducting actual operations. The realism of events during simulation made it relatively easy for officers to quickly apply the learning from training to live operations.

Officers noted that an integral part of maintaining realism in the training was the use of Simunition. Simunition is non-lethal ammunition that is designed for training purposes and is fired from the actual firearms, with slight modifications, used by officers in the field. The ammunition itself is a non-lethal paint ball-like round, but is propelled by gunpowder ("Simunition," 2011). Officers reported that the use of this type of round during training made that training as realistic as possible including the production of the sound of a gunfight and the sensation of pain if you were hit. One officer reported:

> A lot of Simunitions stuff. A lot. You know, it's easy for me and you to get here with our Glock fingers and go, "Bang, bang, I got you." "Oh no, I got you first." Well, with Simunitions you're required to make that split-second decision and act on it, and the Simunitions is the telling tale, whether you made the right decision, you made a decision at all, or you even remember your decision.

Another officer remarked:

> Yeah, it – it makes a world of difference. Simunition, they're paintball bullets. Well, I shouldn't say that. They're not paintball bullets, they're – they're regular bullets but instead of havin' a full-metal jacket or a hollow-point shell comin' outta the casing, you have plastic and soap, and they hurt like hell. It'll cut you open at times. It'll leave welts; it'll leave bruises for weeks. You will know you've been hit if you've been hit by one and – and we train with those on a regular basis, so every tactic that we use were trained out with the force-on-force situation. We're not just going through and training in empty room. We're not just training a room that, you know, has voluntary, compliant suspects in there. We're trainin' against other swat guys who are – are armed with guns that will shoot back at us with these Simunition rounds and that are doing things that we've seen bad guys do, doing things that we know if you don't check that corner, right off the bat, you've done wrong, so – so we've got somebody in the corner checkin', if you don't check the – check the

> corner, guess what, you're takin' shots, so you learn by your mistakes because you get shot because of your mistakes and so that's how you create that sense of urgency.
>
> It's really easy to tell somebody how we enter a room on a search warrant, you know? We can explain that, you know, the whole process and we can have them do it and they can, you know, in a day, feel like, "Oh, I can do that, I can do that," you know? It's totally different when you tell them, "Okay, we want you to do that and, inside that room, there's gonna be an armed man that has Simunition weapon (and if you screw up) he's gonna shoot you.

The training emphasis is on placing officers in realistic simulations which are as bad, or worse, than anything that they might come across in the field. Officers described these high-risk situations as somewhat non-standard, yet they spent their training time in this environment to develop a behavior repertoire to draw on in actual simulations. By exposing officers to extremely chaotic and unusual situations, officers develop their capacity for reacting to chaos during operations. One officer noted:

> It does because when we train, we train these scenarios also, we'll do – we'll do – we'll do entry training for search warrants and we'll start out with this danger and we'll break things down, bringin' it down to its simplest form from the very – at the very beginning, just makin' sure that the foundation is there and we'll build upon that and during that training day, we're gonna use force-on-force training, we're gonna use – we're gonna put together scenarios that require us to operate in those conditions, taking fire upon approach, taking fire inside the house, compromise, shoot/no-shoot decisions, officer-down situations and we train on those because those are the – the high-risk/low-frequency situations for us, we don' t – it isn't standard for us to have an officer down on the warrant.

Officers reported that simulations not only increased the behavioral and cognitive repertoire that can be brought to bear on operations, it also affected the way their minds worked. Officers reported that due to the frequency of training and operations in the field that their "minds worked faster than the environments that they were in," allowing

them to make anticipatory decisions during operations and think faster than their opponents. Consider the following statements by two Alpha team members

> Well, we've already thought about it in our mind, you know? We train – it's – it's – you know, this – this is a high-risk/high-frequency act for us. We train and train and train and train so that our standard, the chaos that we're operating in is normal for us, you know? There's a normalcy to us running warrant that you do 100 times a year, ya know, and then we train on – we probably – we probably 200 entries in training a year. There's – there's normalcy in us operating under that condition, so, automatically, our mind's operating much faster than the environment that we're in. That the environment is slowed down for us, so we're – we're using that skill and also the prior planning that we've had, the thought process. (Alpha Member #1)

> There's a normalcy to us running warrant that you do 100 times a year, ya know, and then we train on – we probably – we probably 200 entries in training a year. There's – there's normalcy in us operating under that condition, so, automatically, our mind's operating much faster than the environment that we're in. That environment is slowed down for us. (Alpha Member #2)

Both quotations highlight the role that simulation and training play in preparing officers for the chaotic situation that they will face in the field. This training process allows the officers to experience operations in a way that they can maintain sensemaking even in the most chaotic circumstances.

Previous Operational Experience

Previous operational experience also provided resources to facilitate officers anticipating suspect moves in a hostile environment. Officers remarked that their sense of the environment and their ability to assess the environment increased with experience. Officers repeatedly reported, "You can't plan for all events. You can't plan for – we try to, but, you know, especially with some of the older guys, like myself and all, that have – you look at something and you go, 'Okay, I remember last time we were here this

happened or that happened.'" Drawing on their previous experiences and making connections to those experiences in light of the unfamiliar situation that they currently faced allowed the officer to create a working understanding of the current environment and, in some cases, to anticipate that environment.

Officers reported that part of using previous experience to anticipate how an operation would unfold was related to the concept of contingency thinking. Contingency thinking is the process officers use to apply what they have learned in past operations to the situation that they currently face in an effort to anticipate how the situation will unfold. Officers looked at existing gathered intelligence and used their past experience to visualize what could happen and plan their counter move. Applying contingency thinking was often used when officers considered potential interactions with suspects or subjects which could produce hostile resistance. One officer remarked:

> I'm gonna already have a plan on what it is that I'm gonna do if I encounter the threat. If the threat does – if the threat is standin' up and won't go down, I already have it, mentally, what it is that I'm gonna do in order to put him down, based upon what it is that he's doing. If his hands are empty and he doesn't have a weapon, how am I gonna put him down whenever I have my M4? Am I gonna do a superman stunt on him and knock him out? Am I gonna kick him? Am I gonna just grab him and put him down, what it – what I'm gonna do? Uhh and the reason I already have all that planned out is because, Number 1, doin' (this) for all those years.

The process of considering contingencies appears to increase the officer's ability to rapidly assess situations and anticipate what will happen with a suspect or situation based on what they have planned out previously in their visualization process. Interestingly, some officers reported that the process of contingency thinking based on experience even impacted their daily lives outside of operations:

> Today at lunch, I'm sitting there and I'm looking around the restaurant and my partner's going, "What are you doing?" and I'm going, "Don't want to be a victim." I'm constantly looking around thinking, "What do I need to do next? If somebody comes in this front door, like a Luby's in Killeen, which way do I need to break, what am I going to do next?" I don't know if it's a curse or a gift, but I go, "You were worried about your enchiladas and I'm worried about you and me." I'm eating lunch, I'm enjoying my lunch, but I'm also keeping, you know, I don't want to be a victim. In today's society a nut job could spring out of the woodwork. You know, we have seen this happen too many times.

Finally, officers related that previous experiences gave them a "sixth sense" or "gut feeling" about a situation or suspect they encountered. Officers sometimes reported situations in which they would enter a structure and something would not "feel" right to them. They knew that something was wrong, or that that suspect was going to do something abnormal, but they were unable to articulate why. In the end, officers attributed the development of this sixth sense as something that experiential learning helped to build. In these cases, the minds of the officers were making connections based on the context of the encountered situation that were preconscious. The officer's senses have had such a great number of experiences through training and prior experience on operations that their senses have become acutely sensitive to the contextual variability. This sensitivity, however, is at an instinctual and intuitive level as it has become part of their practice and identity. One officer reported:

> So the threat, it becomes instinctive. It just doesn't feel right. It's hard to explain, but you know what I mean? You know when you go in your house and maybe something is out of place, or you go somewhere and you think, "This just don't feel right?" It is something that training and experience builds.

Summary

What emerges from the analysis of Alpha team is an understanding of how the SWAT team encountered and managed critical disruptions to their sensemaking. The analysis suggests two categories of critical events capable of disrupting sensemaking and generating significant difficulties during the operation: (1) unexpected actions on the part of suspects in the field, and (2) unexpected activities of other officers on the scene. The presence of either type of critical event was recognized as having a debilitating capacity for officers who had to make sense of the disruption and then take action in order to recover.

Officers highlighted immediate action decisions which had to be made in the face of critical incidents in order for recovery to take place. These decisions were in recognition of the conditions that the officers faced as the situation unfolded and were often immediate tacit responses to highly volatile conditions which negatively impacted the assault. The officers noted that when such decisions were necessary that they would fall back on their training and operational experiences. Officers employed the concept of the OODA Loop as an important tool for sensemaking where they cycled through the following activities: Observe the situation they were facing, Orient themselves to the situation, Decide what to do, and finally Act on that decision. Officers noted that during their training processes they are forced to interact with rapidly changing environments in which they were required to shorten OODA Loop process as much as possible in order facilitate rapid decision making. A second important process that officers describe as being important to recover from critical disruptions is to continuously move forward

during an operation, a process which reorients them to the scene constantly and fosters mental concentration to make sense of the ever changing scene.

Officers identified the experience of critical incidents as opportunities for learning both at the individual and group level. The process of learning from such events normally occurred during a debriefing session or after action review in which each officer gave an account of their actions in the operational theater. Any mistakes that were noted, either at the individual or team level, were then considered and appropriate training measures were implemented to make sure that when the officers experienced the events again that they would know how to overcome them. Officers were encouraged to step forward without fear of repercussion in order to take responsibility for what they had done. This process minimized the stigma associated with the error and reframed it as something which could be learned from and overcome.

Finally, officers reported that the anticipation of critical events was strongly linked with their field experiences and training. It is for this reason that young officers are not placed in highly volatile roles immediately but spend a great deal of time on rudimentary tasks, interacting with officers in planning and debrief, performing supporting and observational roles, and engaging in simulation. Through these processes the young officers develop a baseline concerning how suspects act and what can be expected based on their actions. This provides a basis for officers to anticipate critical events before they manifest. The ability of officers to anticipate suspect moves is further enhanced by developing a strong operational focus through the creation of a Warrior Mindset in which the officer prepares for the worst case scenario. In the event

that the worst case does happen, the officer has prepared mentally to avoid hesitation and can continue to function. Furthermore, officers reported that preparation and intelligence gathering were essential practices that helped minimize the impact of critical events and facilitated eliminating or avoiding variables which would slow the process of the team.

CHAPTER IV

BRAVO TEAM

The second case study involves the largest police department studied given Bravo Team's location in a large metropolitan area. Bravo Team is a unit that consists of both full-time and part-time officers. While a portion of the team is considered the full-time SWAT team, the other team members function in a part-time role and are integrated into operations when needed. When the SWAT team is not needed, the part-time members perform other duties within the department. Interviews were conducted with eleven officers of the twenty-officer team representing both full-time (n=6) and part-time (n=5) team members. Based on the accounts provided by respondents, the team conducts operations regarding high risk warrant execution, hostage situations, barricaded subjects, and other high profile duties requiring advanced organizational tactics for success.

In the results section for this case, I will address each of the research questions presented in Chapter I. However, before presenting the results it should be noted that the accounts and exemplars these officers provided were dominated by two recent events that the team had experienced. The first operation was one that I was allowed observe in the field on the first day that I conducted interviews. As this operation was fresh in the mind of the officers during their interview, and as they knew that I had been present during the operation, it was frequently referenced in officer interviews. I will provide greater details concerning my observations during the operation when addressing the

research questions. The second operation, which I will summarize below, concerns a mission executed in November of 2010, which was referenced consistently by officers given its applicability to the focus of the study.

RQ1: What kinds of critical events disrupt sensemaking and coordination in high reliability teams?

It is noteworthy that officers were reluctant to admit to events that they were unprepared for, often explaining that their training and experience prevented such surprises. Officers stated that as their experience with operations increased, they experienced a marked decrease in the number of times that they were shocked during operations. Furthermore, when critical events did take place which caught officers off guard, there was a strong feeling that officers should have been prepared to anticipate the event. Consider the following officer's account that had been with Bravo Team for twenty-nine years:

> I'm not saying we're gonna answer all the questions, somethin' may come outta the ordinary and surprise us but it – it all depends on your training, your discipline and how you're gonna approach it, you know what I mean, and I like to think that because – you know – I don't – I don't – I'm not saying I won't ever be surprised but I haven't been surprised in ages, you know what I mean and it could happen today on another warrant if we get another one, so I'm not saying it won't happen but I like to think that, okay, I'm ready just in case, you know?

Even with a strong emphasis on being prepared and "un-shockable," officers did reveal three categories of unexpected events: (1) events in which the suspect took some unexpected action during an assault, (2) events involving officers taking unplanned or unexpected actions during missions, or (3) situations in which intelligence gathered was inaccurate causing officers to run into unexpected variables during operations.

As an example where a suspect did something unexpected, consider the previously referenced operation in November of 2010. Known as the "November Event," this critical event involved a suspect inexplicably opening fire on officers during an operation. The November Event occurred when officers were called upon to serve a warrant on a known drug dealer. During the operation, the officers entered the front door of the home and made their way into the living room where the suspect's sister and niece (an infant) were sitting on the sofa. The suspect was in an adjacent room, which had been identified during intelligence gathering as a garage. However, contrary to intelligence the garage had been converted to a living area, and the suspect was located there with a prostitute. When the officers entered the house, the suspect panicked and opened fire with an AK-47 though the wall separating him from the living room where the officers, the suspect's sister, and the suspect's niece were located. Two officers were shot and seriously injured during the assault. While SWAT officers are always cautious in case a suspect decides to fight, most suspects do not. In the case of the November Event, officers did not expect the suspect to blindly open fire into a room where his sister and niece were sitting. One officer recalled the event noting:

> As soon as the door got breached upon, there was a lady and a baby sitting on a couch watching TV. We put them down on the ground and started going into the house.
>
> I went with another officer, who's no longer here…and we started heading to the back left of the house, which is where the intel said he stays. As we're heading into the back left of the house, we start hearing gunfire. He had picked up the AK-47 from the converted garage and started firing through the wall…This was even though his sister and niece were sitting right there, he was going to shoot past them, too. He didn't care about them.

> The woman that was with him was a prostitute that he had just picked up. He was sitting back in a recliner getting a blow job, and she had headphones on. She tells the investigators that "I heard the breach of the front door, and I heard police with headphones on. I took the headphones off, and he got up out of the chair, went to the door, picked up the gun. I told him, 'That's the police, you fool,' and he just started firing through the walls anyway."

Officers also reported experiences in which fellow officers took actions which were unplanned or unanticipated often referring to such actions as “mistakes” by the offending officer. This was true even when officers reported themselves as the cause of the unexpected incident. One officer noted an experience in which he failed to clear a fence that the team was attempting to jump while making an approach to a structure for assault:

> So, we’re trying to jump these - these wooden fences. And, so I go I get to the top, we clear one. We get to the next one, cleared another one. And, so I was at the, like maybe the third privacy fence, and I get to the top - I get to the top and - and the wood just gives. And, so I’m stuck at the top of the - of the fence and with all my gear and I’m like, “Hey, here take my rifle,” and take this and take that, because we were carrying so much stuff.
>
> We were trying to get to the back of the location to kind of - we were setting up our - our perimeter and so - so I was stuck up there for a while. I was like, “Man, I can’t get out of this.” I said, “Y’all are going to have to pull me down.” Or, just - either just throw me over, because I can’t get down. In the end they continued without me. They had to adapt the plan to deal with the fact that I was not there, but they made the adjustments and got me later…
>
> I just screwed it up…I am too big of a boy to have expected the thing to hold.

In this example, the team is forced to make several decisions in rapid succession due to the mistake of the officer. First, they have to decide if they can free him and continue the mission as planned. Realizing that was not possible, they then had to decide how to

alter the operational plan within seconds and continue the mission. Aborting the mission was not an option as the suspect was alerted to their presence by the noise associated with the fence breaking. All of these alterations flow from the mistake of the officer and the necessary alterations to the plan to complete the tasks of the team.

Officers reported the third type of disruptive critical event is inaccurate intelligence gathered prior to the mission that resulted in officers arriving with a set of false expectations upon entry. Officers reported several situations in which they had planned assaults over several days leading up to the operation by gathering intelligence from a variety of sources including confidential informants, other officers, the internet, and through first hand efforts, only to find at the time of the operation that the intelligence gathered was inaccurate. In these situations, officers performed the assault on a structure with certain expectations regarding the situation which were quickly violated. This initially caused confusion and slowed progress which then required the team to alter their plans during the ongoing assault, often moment-to-moment as the scene unfolded. One officer remarked:

> Usually the detectives that come in with these search warrants, they have CIs, which are confidential informants. They tell the detective, okay, this how the house looks: "You go inside, as soon as you go inside to your right there's the stairs leading up to the second story, or second floor, or whatever." They'll describe the location to us.
>
> And, there's been - there's been several times you - we've breached that door and we've come in totally different. There's a wall in front of you. There's a hallway to the left. No stairs. The stairs on the back right, deep right corner - you know?

Walking into a structure with a given set of expectations concerning what you will find and then finding something else leads the team to hesitate and slows the assault while

officers are forced to try and make sense of the new situation that they faced. Officers and their teammates were forced to adapt on the spot and proceed in an environment where nothing is now certain.

RQ2: How do high reliability teams recover from critical events that disrupt their ability to make sense of and coordinate their activity?

When facing situations in which critical events took place, officers reported relying on their training and previous experience which allowed them to make sense of the unfolding situation, make adjustments to overcome the critical incident, and move forward. Officers associated recovery with shortening their OODA Loop process in order to allow faster decision making (see Chapter III for a full description of the OODA Loop process). When facing uncertainty necessitating immediate action, officers noted that previous experiences, in which they were placed under stress, both simulated and operational, allowed for quicker assessment and decision making processes. Officers observed that as they gained experience in pressure situations, their ability to rapidly assess the situation and make an accurate decision improved and the decision making process was shortened. One officer stated, "The more you do it, the quicker the assessment comes and you just start reacting the way you were trained… The more stress you put yourself under and the more you do it, the more you can kind of process that stuff quicker."

Officers reported that the process of immediate action decision making and working through their OODA Loop process was heavily reliant on assessment of the situation and the constraints facing them. Officers described a conscious "thinking"

process in which they engaged in a cognitive assessment of the situation in light of their training and operational constraints. For example, one officer reflecting on the November Event recalled his thought processes while being fired upon. The following example illustrates his conscious assessment of variables and constraints to his decision making process and the subsequent reliance on previous experiences in training to make those assessments during the critical moment.

> So once I'm through that, I'm thinking, "Deep breath. Everybody's down. If this guy's going to keep firing, I've got to get bigger rounds. Should I advance on him or not? Should I hold where I'm at? Do I fire through the wall? I have to know."
>
> Again, all of this is going through my mind, "But I'm accountable for my rounds. I have to know where my rounds are going. I can't just blindly fire through the walls. What if my round goes through the house and into something –?" You're thinking all those things, and all of that comes from training.

While surprised by the unexpected gunfire, the officer immediately begins an assessment process where he is weighing out what he should do next. Furthermore, the officer is also considering constraints which serve to limit the number of choices available for moving forward such as his accountability for fired rounds. Even in the heat of the moment, the officer describes how his experience and training guide his decision making at a conscious level and allow him to make sense of what is happening and make an immediate action decision to move forward.

In conjunction with the conscious decision making process described above, officers also reported that their perceptions of time slowed down during critical moments. This “slow motion” experience seemed to allow officers to focus on the situation and access cognitive schema which allowed them to work through the problem

in a coherent manner. By slowing the process down, officers describe a way to take a rapidly unfolding chaotic sequence and work within it in order to process it mentally and make sense of it. One officer, recalling his role in the November Event, reported his thought processes as the suspect opened fire through the wall noting:

> He was firing several numerous rounds through the walls, and that's when all the training kind of kicked in. Everything became very surreal. It was almost like, I tell people it was like *The Matrix*, when I was in the room, I could actually see the bullets exploding through the wall. It's like everything slowed down in my brain, and you'd actually almost see the rounds going by my head. One grazed my face…

Another officer noted a similar "slowing motion" process which unfolded as gunfire began in the November Event. Similar to other accounts, the officer points to training as the process which makes this type of calm assessment possible:

> It took me about a second or two, because I heard the noise. It's by the grace of God that I didn't get hit from behind, because I'm actually going into one of the bedrooms there in the back left of the room, and he's on the other end of the house firing through.
>
> I remember stopping, and everybody getting down. I was kind of looking at everybody, real slow motion. Hindsight, I was thinking, based on the training we've had, that under extreme stress the fight or flight that kicks in for everybody. I was seeing that some were lying down and taking cover. There were a couple of us up and ready to fight.
>
> That's when my thinking started slowing down – Okay, I don't know what he's shooting, but it's big rounds because it's traveling through the whole house. It's going all the way out through the other side. They did tell us this guy had an AK, so let me change my rounds and put slugs in. So that's what's going through my mind at the time.
>
> A lot of it is a training thing. It's very much a training thing. It's a stress inoculation that we put ourselves under. When we train for events or scenario-based events, we try to put ourselves under as much stress as we can and inoculate ourselves to as much of that as possible.

Officers also worked to make sure that their mental processes remained active and uninterrupted regardless of what they were facing. Officers noted that part of maintaining that constant state of conscious sensemaking involved constant forward motion. Officers reported that they were encouraged to constantly "look for work" or "look for something to do". Officers noted that they had been taught to constantly assess the situation as it unfolded and look for problems which needed to be addressed. When such a problem was encountered, it then became their duty to address that situation quickly. Passing the responsibility of addressing the problem to another officer was severely frowned upon, as each officer was encouraged to address what was in front of them as it unfolded. Officers reported that when they consistently looked for work and kept moving forward, they were able to perform at a high level and remained actively engaged in the unfolding operation. One officer's account stated:

> We got a saying "look for work". If you're seventh in the stack, you still have a job to do. If everybody in front of you has everything fixed, find something else to do, look for work all the time. There's no every time where you're just there holding up a weapon and you've always got to be looking for something to do. Keep moving and keep thinking…always thinking moving and making sure that you have got your end of things, you know? You never just stop and stare into space and assume everything is done until you are back at the office and code four (No further assistance needed).

This concept of continuous processing is encouraged by other officers on the team. Officers noted that there were times that they felt that it was necessary to cue other officers to address a problem or situation they encountered by calling a brother officer's attention to it. However, if another officer overlooked a situation that they should have noticed and addressed, they had no problem calling that situation to the

attention of the group, or the officer who overlooked it, during the mission. One officer offered this account:

> So you gotta take the initiative, you can't sit there, if somethin' needs to be addressed and it's not just me, it's anybody on a team and you – you know, sometimes your voice, you know, may sound a little offensive but in this unit, nobody takes it that way because it's like, you know, there's not anything that we will do to harm another individual on this team, that's the whole purpose, so they know that if you're speaking like that, that you mean business, that's it's, hey, that it's possibly, you know, hey, it needs to be addressed.
>
> So and it doesn't matter who it is, whether it's me, whether it's the youngest guy on the team, it doesn't matter, you know, you see something needs to be addressed, do it, you know, without being told. Don't be robots. I don't believe in people being robots. We're all men; we hafta be able to think on our feet constantly.

Another factor generated from the accounts of officers that enabled team members to recover from critical events was the ability of officers to perform a variety of roles during operations. Officers reported that prior to conducting operations they were assigned specific roles with designated and finite responsibilities. These roles were described as being assigned based on an individual officer's ability or areas in which the individual officer excelled. Officers noted, however, that every member of the team was expected to be able to perform any role or skill in the event of an emergency, including those outside of their assigned role. In the event that an officer became incapacitated or could not perform their assigned role any fellow officer had to be able to perform the role himself. Officers reported by encouraging cross training they were able to adapt and recover quickly from critical disruptions without missing some aspect of the mission. One officer noted:

> We're fortunate because you cross-train and if the breacher's about to breach and he goes down, whatever reason, anybody else can pick up that ram and hit the door. Do they want me hitting the door with the big ram? No, I'm not the biggest guy, I'm one of the smaller guys but I can do it if I need to do it.

Finally, having a backup plan was mentioned as being an important resource for recovering from unexpected events if the operation fails to unfold as planned. Due to the bad intelligence often obtained from those outside the team in the planning stages, a backup plan is regularly composed prior to assault which allowed for rapid response to unexpected events. During my visit to Bravo Team, I witnessed an example where such an intelligence failure required the team to transition to its backup plan to manage an unexpected situation. I observed the team during a warrant execution and watched the process during briefing, execution, and debrief and conducted interviews after the warrant had been served.

Prior to the execution of the warrant, intelligence indicated that the suspect was home alone, there were no children in the home, the front door served as the primary point of entry and was not barricaded, and there were no dogs at the house. All of this intelligence turned out to be incorrect and required several rapid adaptations by officers. Yet, during the briefing officers discussed what would need to be done to maintain surprise in the event of an intelligence failure. For example, a barricaded front door would delay entry into the home reducing speed and surprise and allow the suspect more time to figure out what was happening and react. Officers determined that if the door was barricaded that they would need to use a distraction device to confuse the suspect

and gain them more time to get the door open and gain entry into the home or transition to a another point of entry behind the house if the door proved too difficult to open.

While attempting to breech the door, officers noted that a barricade was in place. At that time, a designated officer threw a distraction device (a flash bang) through the front window of the house into the living room per the backup plan created in the briefing. This distraction gave the breeching officer sufficient time to overcome the barricade, a process which took several seconds during which the breeching officer had to physically pry the door from the hinges in order to gain entry. Overcoming the barrier allowed the rest of the team to enter the house rapidly and overwhelm the suspect and the occupants inside.

What was of interest to me during the observation was the seamless nature of the transition from the primary plan to the backup plan upon discovering the barricade was in place. In what seemed less than a second after the barricade was encountered, the officer in charge of deploying the distraction device recognized the obstacle and executed the backup tactic. By discussing the backup plan in advance the decision making and action process (the OODA Loop) was incredibly brief in the critical moment that the delay was encountered and rapid decision making, action, and recovery were facilitated.

RQ3: How do high reliability teams learn from experiencing critical events that disrupt their ability to make sense of and coordinate their activity?

Officers routinely noted that experiences in training and the field were essential to providing the necessary background for immediate action decision making.

Furthermore, officers noted a particularly strong correlation between experiences and learning. Of particular interest was the concept of mistakes made during operations, how officers viewed those mistakes, and the impact of those mistakes on learning. Rather than be viewed negatively, mistakes in judgment or operational process were reported as opportunities for both individual and communal learning and considered a natural part of the experiential learning process. Officers noted that the formal debriefing sessions after operations were seen as opportunities to acknowledge mistakes and areas for improvement that began the process of correction and improvement. Formal debriefs occurred in a group setting following operations upon return to SWAT headquarters. I personally witnessed the process of debrief during my visit and will present a basic synopsis of the process.

Upon completion of the warrant operation I observed, the team returned to the briefing room where supervising officers took control of the debriefing process. The first step was to sketch the location on a whiteboard based on the cumulative recollection of officers present during the raid. All officers taking part in the raid worked together to assure that the diagram created represented an accurate visual recreation of the raided structure. Of particular concern was accounting for any and all variables which had not been accounted for during the briefing process as well as errors in intelligence. For example, in this operation the officers encountered a New York style barricade which required them to adapt their primary plan. As the sketch of the location was completed, the New York style barricade at the primary entry point was added to the sketch and clearly labeled. After finalizing the reconstruction of the scene, the sketch was

photographed and became part of the organizational memory in case the team has to return to that structure in the future.

The debrief continued with the supervisor making opening and overarching comments concerning the effectiveness of the raid and any and all obvious problems which arose during the operation. For example, during the raid I observed, the assault vehicle had experienced a small malfunction during entry. The supervisor called attention to the malfunction, in this case there had been a defect in the bumper which was discovered, and then discussed how to fix the malfunction and prevent future issues.

After this, officers active in the raid summarized what they observed from their point of view during the operation. Officers noted what they had done well, or things that other team members had done well, while also acknowledging any and all mistakes that they personally made or witnessed in others. During my observation I became aware that officers would candidly point out mistakes made by other officers, or make inquiries concerning the actions of other officers which they could not readily explain. I found particularly interesting the egalitarian nature of these comments, as even young officers seemed comfortable pointing out or questioning the activities of officers with considerably more experience and, in some cases, higher rank. This process seemed to be supported by all members of the team and appeared to be a normal process. When officers were faced with open criticism of their actions, they quickly accepted responsibility without any observable resentment of hostility toward officers who pointed out errors in their performance.

Officers involved in the debrief process seemed very reflectively critical of their own actions during the operation. Officers often went to great lengths to point out areas where they believed that they could have personally improved their performance during the operation and appeared to have a strong sense of personal accountability during operational procedures. The self criticism described here seemed well supported by other officers, and officers did not appear to feel threatened by pointing out their own mistakes. On the contrary, officers paid close attention to officers who engaged in self criticism and commented only when they felt that their personal experiences were congruent to the speaker or when they had experiential knowledge which they believed could assist the speaker in some way in the future.

At the conclusion of the officers' accountings of the events of the operation, the supervising officers then directed the discussion to the areas of training and future operational preparation. This discussion seemed rooted in the previous areas identified by officers in which they had personally made errors, noted areas for improvement in other officers, or in which they noted that the team could improve performance in some way. For example, another unexpected event brought about by faulty intelligence was the presence of a pit bull at the home which had to be dealt with prior to the team making entry. This discussion became an opportunity of operational improvement, as officers began a discussion of what procedures would be necessary in order to get better and more accurate intelligence prior to executing warrants and eliminate holes in their intelligence. While the discussion itself was left somewhat open ended with respect to

intelligence gathering procedures, decisions were made concerning how attack dogs should be dealt with in the event that they were unexpectedly encountered.

While interviewing officers concerning the debriefing process, I was particularly interested in the acceptance of open criticism. Officers noted that being "picky" or hard on one another in the after action review process was a key to consistent development of the team and improvement. Officers felt that "being hard on each other" was a key to improvement, and that "ignoring mistakes and errors" after an operation did little to foster improvement. Officers further noted that in the heat of operations that they often became so focused on what was happening that they lost sight of their own actions and relied upon what other officers saw them do as a way of obtaining feedback on their actions. It was also noted that no mistake was considered so insignificant that it could be ignored. Rather, identifying even the smallest errors provided opportunities for learning and continual improvement. One officer, when reflecting on the value of acknowledging and learning from even minor mistakes noted:

> Because you learn from your mistakes and you hafta move forward and that's the biggest – for instance there was no big hiccups today, it went pretty smooth but when there are hiccups, we nitpick, we're a very proud team and we really nitpick because what may look, "Oh, y'all did good," yeah, it went pretty good but we could've done this a little bit better. This may have been a little bit faster; it may have been more efficient if we had done this you know?

While reflecting on the debriefing process, another officer also noted the connection between making mistakes and the need for additional training to assure that mistakes did not repeat themselves. He equated the training process with the development of current and new cognitive scripts for working with future events to

assure that the mistakes made in current operations do not reoccur, particularly after training activities:

> If somebody really made a mistake, we're really hard on each other – "Hey, you shouldn't have done that and this is why. These are the lives you put in jeopardy because of what you did."
>
> Once you identify the need, you train to fix it…training is very important. To always train, train, train, and everybody (works to be on) their game and train like you're gonna fight kind of thing. The mindset when you go into training is always to train like it's for real. So when it is for real, you've done it a million times in training and it's kind of like a piece of cake.

Reflecting on the entirety of the debrief process it appears that the primary focus was creation of an opportunity for individual and group reflection after operations. Essential to this process was creating an environment where officers felt comfortable calling attention to their own shortcomings or the shortcomings of other officers without fear of repercussions after the meeting. The debriefing process not only forced officers to deal with their perceptions of personal strengths and weaknesses, it also gave them an opportunity to assist other officers through sharing experiences and perspectives allowing all members of the team to continuously learn. Through the interactions during the debriefing process, officers discovered opportunities for improvement through further training and adaptation allowing for continuous improvement with every mission.

RQ4: What facilitates high reliability teams anticipating the onset of critical events?

Officers repeatedly noted that experience was a key factor in determining how operations were likely to unfold. This extended to the evaluation of suspects encountered during operations and assessing what they might be planning to do in the

face of arrest. Consider the following officer's account of the value of experience when attempting to anticipate what the suspect would do:

> The probability is that because he's right handed and because he sees law enforcement, its' in his waistband and he'll be nervous, so he'll reach over and will touch is waistband with his right hand. I'll see that movement, and that touching his right hand will draw my attention. It's that very subtle movement of just reaching over and making sure his gun is secure and still there.
>
> Now, could it be a gun? Could it be a colostomy bag? But that movement will attract my attention, and that's how you start anticipating things before they even happen based on just those real subtle things that you start picking up. That only comes through experience - being out on the street, working patrol, doing SWAT, those kinds of things.
>
> You have to learn those kinds of things…That's actually life experience from that kind of stuff.

Throughout officer accounts of missions in which they were able to anticipate developments in the operation, experience was consistently reported as key element from planning through the actual execution of the operation. In order to illustrate this concept more clearly, I will present the remaining themes in a loose chronological format as they might manifest during a SWAT warrant operation. This organizational pattern provides a greater understanding of how activities related to anticipation unfolded in real time.

Warrant operations begin with a great deal of planning and intelligence gathering which may take place over several days, and it is at this point that the process of attempting to figure out how the operation might unfold begins, as officers begin assessing the variables and situational factors that could impact the raid. These pre-operation assessments allow officers to tactically plan for obstructions and ways of

overcoming them, as well as assess the options for resistance and escape available to the suspect. One officer highlighted some of the variables that officers hope to assess during this pre-operation assessment and how they may be managed:

> We're looking for the best route to get there. And, then when at the house making sure that's the - or the target location looking for the address, looking for the door, where the door's located, any fortifications, any on the door, the window, dogs, people out, what kind of traffic's coming and going. That's what - that's what kind of stuff we're looking for.
>
> The planning, first route, best, quickest, easiest route. Second is approach. Third we, I guess, we decide which is going to be primary entry, door, window, side door, back door, whatever, that's why the video is so important in this recon.

Officers cited the need for first-hand intelligence in developing a profile of the variables that could influence the operation and how they could be overcome. This process was carried out with a reconnaissance team consisting of four SWAT members who would later be taking part in the mission. One officer explained the reconnaissance team and their various roles saying:

> You got the breacher, who's going to do the breaching (breaking through the door). He's looking for - he's got one job (to) look for what's the best entry for the location. And, then you got the point guy who's going to lead up the entry team, so he can know the approach. And, then you've got the driver of course, and then you got a breach cover guy.

Primary intelligence gathered by the reconnaissance unit was always preferred over intelligence which came from secondary sources. Secondary sources included any and all sources that were not under the immediate control of team members and thus could not be verified by operational officers. Any information gathered from these sources

was viewed with skepticism and viewed by officers as being notoriously inaccurate. One officer reflected:

> We get intel all the time – people saying, "Oh this guy's a big bad ass. He's got AKs." We go in the house, and he's the biggest whiney baby I met in my life with a BB gun. You're like, "Ooh." So to hear that intel, it doesn't change you like one way or the other, because the intel – like this morning, the intel was all bad. It was all wrong. They told us there were no dogs, no babies, and only two people in the house. We had like 12 people out there, 2 babies, and a pit bull.

Using a combination of firsthand and secondhand intelligence, the officers then set about creating a plan to defeat identified variables associated with the potential of delay and facilitate the most rapid entry possible maintaining the three prong approach associated with successfully crushing the OODA Loop of the suspect. By predetermining ways to maintain surprise, speed, and violence of action during the raiding process, the team significantly reduces the chances that the suspect will be able to resist. The planning process seeks to significantly reduce the options available to suspects, and by limiting the options available to suspects, the suspects can be overwhelmed and stuck in their OODA Loop until they are secured. The basic premise for maintaining reliable performance is that all operational decisions should flow from gathered intelligence and that the intelligence should be used to anticipate how the suspect could interact with identified situational variables. Intelligence provides the data necessary for operational decisions including personnel selection, equipment selection, and determination of operational protocols.

Once intelligence has been gathered, a process of developing an operational plan begins. While individual officers, typically including the detective bringing the warrant

to SWAT, present the gathered intelligence to the team; each team member who will be involved in the operation has the opportunity to give input. One officer noted:

> So, (we) come back to the office. Get the best plan possible. Everybody - the whole everybody - everybody's who's going to run that warrant has an input. So, it's not just one guy, "Hey, this is what we're going to do. This is my plan." No, no, it's the whole - everybody puts their little two cents in.

If an officer is to be involved in the operation, the officer must be present at the time of this briefing and planning session. Officers noted that this protocol was established after the November Event, in which one of the officers who was shot was not present for the entirety of the briefing and was added to the operation at the last moment. This was determined to be one of the root causes which caused a breakdown in reliability during the critical event. Recalling the incident, one officer noted:

> He walked in, in the middle of the briefing, and he says, "Hey put me in," so I said, "Okay," I said, "I'm not gonna tell my lieutenant no," I said, "Sure," so I just added at the back of the line and he was a prior SWAT, he was on the team before as an operator and now he's back as supervisor, so he was familiar with our tactics and our movements and stuff.

For the mission I observed, I arrived for the briefing and was able to observe the conduct of officers during the briefing and planning process. Of particular interest was that officers were encouraged for input regardless of rank or seniority. The officers appeared to value the input of other officers regardless of their rank or tenure with the team, and the briefing was not considered complete until every officer's input had been solicited and any and all questions concerning the operation had been addressed. Officers noted that this process was necessary to assure that each person had a common mental construct of the operation being conducted, and that each person was aware of

the job that they were required to do. Upon reflection, this process of establishing a shared mental model of operational process as a team seemed to perform two functions. First, it allowed officers to make sure that they fully understood the nature of the mission and how it would be conducted. By conducting the planning and briefing session as a group, a secondary function was the development of communal confidence within the team concerning other members' understandings of those same operational components. This process becomes essential to determining not only what the suspect might due considering variability in the situation, but also may have an impact on anticipating how other team members may act during the situation.

Officers noted that a process of mental preparation began to take place at the individual level after the plan had been finalized. A great deal of commonality was noted in the accounts of officers discussing their own mental preparation regimen. Officers describe this process as one of "mental focusing" in which they prepared to enter the operational environment so that by the time that they arrive they are fully focused on the task at hand. This level of focus is described as so intense that nothing else enters the mind of the officer other than the mission. One officer noted during the November Event that one of the bullets fired by the suspect grazed his face and his level of focus was so intense that he did not feel the bullet wound until after the mission was over. This level of focus was linked to activities carried out later during the operation and was associated with being able to anticipate potential disruptions and make quick decisions. When reviewing the accounts of officers, two themes associated with

officer's thought processes emerge: (1) taking into account the other members of the team through team loyalty, and (2) development of focused confidence.

Officers repeatedly noted that one of their central motivations during operations was to "not let anyone on the team down." This sense of team loyalty moves team members reflect on the value of other team members to them prior to the mission and to make it their duty to protect their fellow team members from harm. The sense of team, and team dedication was pervasive, and officers reported that part of the mental focusing process during this period required a reflection on the value of other members and their responsibility to them as individuals and the team as whole. One officer noted:

> That focus, that tenacity, that drive that like, "Man, I wanna be better, I wanna do good and I'm not gonna let 'em down." I mean we'll beat each other up… and we'll hit each other but, hey, if someone outside the team comes over here and (does that) it's their last mistake... It's like a family and we don't wanna let each other down and that feeling of, man, that drive. That tenacious feeling, that mentality is just – it's kinda like inculcated in your mind that you're not gonna let your brother officer down or your brother SWAT officer and then, too, what we go through, from the training to the workouts to the warrants that we do.
>
> Every time it's some serious stuff, you know, and you don't wanna be that guy that's there and something happened to your buddy and this past year, we hadda couple shootings and so the last thing you wanna hear is your buddy on the ground, yellin' for help and ya hear it and it's like, wow, like, stay focused, stay in the game…

The same officer later reflected on the impact that this dedication to other team members had during the process of operations when critical events disrupted team processes. In recalling the November Event, the officer noted that at one point he was alone and face to face with the suspect who was continuing to shoot at officers. His thought process reveals that the officer's sense of dedication extended to his subsequent

decision making and how he anticipated subsequent moves by the suspect. After reacting to suspect opening fire and shooting two officers, the officer's account indicates that the sense of team dedication drives his decision making, his consideration of what the suspect might do next and what reaction would be necessary to recover on behalf of the team:

> But I'm thinking, "If I take rounds – whatever happens, whatever's coming next, I'm just gonna advance on this guy, and I'm gonna kill him based on what he's done. He is not leaving here, and if I have to die to save somebody else, no problem. That's not even an issue." That's how I felt about it, and that's what kind of kept me going. Let me protect all my other brothers. If that includes me taking it for them, then that's what I'll do.

The second facet of mental preparation noted by officers is the development of focused confidence. Officers described this process as "preparation for battle, if necessary." Officers noted that while it was rare that shots were fired or situations got out of control that it was always better to go into an operation with the anticipation of resistance by the suspect. Officers reported that entering into a structure mentally prepared and focused gave them a tactical advantage in the event that the situation did not go well. One officer noted:

> Anytime you do a warrant and you go in a house, you're the shark and you're looking for the bad guy, you're hoping – not hoping to get in a shoot-up but you're gonna get in a shoot-up…that's what you train for and you gotta have that edge, that confidence. It's not cocky because cocky gets people hurt. It's confidence and it's thinkin' on your toes, thinkin' on your feet and makin' the right decisions and working together as a cohesive unit and to execute a problem and when those bullets are flying, you feel like, "Okay, this is it, this is a test, this is my test, we're all being tested here" and I don't know how to explain it but it's a feeling of this guy is not gonna beat me.

> This guy is not gonna beat me, I'm better than him and I train and I shoot and I train, I shoot, I train, I shoot more and I train more and he's not gonna beat me.

The process of mental preparation largely takes place during the ride to the structure that the team is planning to assault and is typically reported as taking place at the individual level. However, in the final moments leading up to the assault itself, this particular team had developed a unique ritual which served as a final reminder of each member's dedication to task and team membership. Officers reflecting on the ritualized behavior often remarked that it was the final element of focusing on the task at hand and heightening the senses necessary for them to be successful during the operation. One officer explained the feeling of the ritual and the reason behind it saying:

> But ya come into this team and we're real tight, we're like a family and it's funny because, like in a family, ya have your jokers, you have your serious guys, you have your guys who are constantly thinking about things and that's the way it is in that van but, ya know, it's – when we first get in there, we kinda get – kinda grab-assin' and kinda lettin' loose but I don't care who you are, you're still thinking about, "Hey be ready, game on" and it's funny because the closer that we get to location, the quieter it gets and then seconds out, minutes out, it's dead silence because everyone's focused and it's the rush, it's the brotherhood, you don't let your teammate down and your just kinda like – man, it's like – it's like an honor to be with these guys, you know, and, of course, we lost a SWAT officer ten years ago and his name was Rocky XXXX and so every time we're seconds out, we always bring it in on Rock and so today it was – I did the briefing, so whoever runs points and usually does the briefing, that guy brings it in (on Rock), so we say a few words and as of something like – hey keep your head straight, no one gets hurt but the bad guy. Probably a few other choice words… And, "Hey, Rock on three, man, one-two-three-Rock!" And it brings us together. And once we do that, we get situated… and then – boom – it's gig time.

Once the team arrives at the assault location, the process of executing the warrant begins. Central to this process is encountering individuals within the structure and

assessing those individuals for threat potential, securing those individuals, and continuing to pursue the objective of finding and securing the suspect. The process of encountering and assessing individual's threat capacity was often associated with the concept of anticipation by officers. Officers reported that over time they developed an ability to assess an individual in context and determine with a high degree of probability what the suspect would do next.

> I mean, we could go drive right down the street and we could do – I could – we could go in a neighborhood over here and say, "Hey, I can tell ya, this guy's gonna run," or "no, he's gonna be – he'll cooperate" and most of the time you're right but body language, maybe just being a policeman with experience that you just learn over time that this guy's fidgety, he's gonna run, I know he's gonna run.
>
> It's just all these little things you pick up on over time and you never know 100 percent whether someone's gonna fight or flight but a lotta times the shock-and-awe and our initial presence there, most people, you'll know in a second or two whether they're gonna fight or whether they're gonna – or they're gonna comply, so most of the time they comply.

Officers further described that anticipating the actions of a suspect was closely associated with scanning. Scanning is described by officers as entering a room and taking in the entirety of the room visually through a process of visual assessment. As the scan takes place, subjects are located within the room and their potential to pose a threat is assessed based on their actions and the resources that are available to them. The process is described as rapid. If the process is carried out correctly, officers reported a high level of certainty in "knowing" whether a suspect was going to pose a threat or not. One officer reflected on the process during entry:

> Everybody is a potential threat. This comes down to the training, and what we do is called a quick scan – a scanning sequence. Years ago, we

> were initially taught to always watch the hands because what's in the hands can kill you. That kind of stuff.
>
> What we do now is we go one step further. We look at the whole person first, because if I just look at your hands and you've got a gun in your hand, I may not see the badge on your chest or on your waistband.
>
> So I take the whole person first, then the hands, then the waistband, then the reaching and lunging areas, and then the demeanor of the face. It's a sequence that we follow.
>
> So when I come into the room, I'm looking whole person. I'm already looking hands, waistband – are they touching, are they doing stuff. If I can, I'm kind of looking around if there's a table or a chair that they're next to. I'm glancing everywhere. Your heads moving and looking a lot and looking at their face.
>
> They'll either have that "Oh shit" look on their face, or their face changes to that "I think I want to fight you now." Depending on where I'm at and what their hands are doing at that time if that face changes, that determines are they going to get a boot and put down really, really hard or are they going to get shot or something like that?
>
> If they've got that "Oh shit" kind of look in their face, then we usually take them and put them to the ground – or they usually go to the ground because of just panic.

Officers also noted that contingency thinking was essential to anticipating what a suspect would do when encountered. Officers often linked the contingency considerations with the suppression of critical events resulting in surprise and subsequent disruption to team process. Accounts point out that experience via training and operation in the field was essential to the development of contingency thinking as that experience was drawn upon to determine options available to the suspect in a given situation. By anticipating moves that the suspect might be capable of making, officers then reported that they could formulate potential responses based on what the suspect might do. This led to such rapid assessment and decision making when the suspect

actually did make one of the predicted moves that officers normally characterized the response as instinctual or precognitive. Interestingly, the process of contingency thinking was described as both an individual internal process of contingency consideration and as a process that was conducted communally. One officer noted:

> I'm always what-iffing, I'm constantly, when I've ridden with young officers and things, I always tell 'em, "Hey, think about this, if this guy does this, whaddaya gonna do, if a guy comes out with a gun to my head, whadda you gonna do, you know, if he gets a jump on me, whadda you gonna do, you know?" and my partner and I, we used to constantly discuss this in a car when we were riding together, okay, man, this – if this happens we're gonna do that and if that happens this and that. It got to the point where he and I wouldn't even talk, verbally, we would know what each other was gonna do, you know what I mean? It was like he'd hit me before I would even say anything because I know what you're thinking, you know what I mean?

Officers noted that that so many scenarios had been considered that it became somewhat rare that the actions of another individual fully caught them unprepared. While they would acknowledge that this could happen, contingency thinking was described as reducing the probability of surprise or shock.

Finally, officers described that during the most unpredictable events in which surprises did take place, forcing decision making into the most truncated state, immediate scanning of suspects allowed for almost instinctual reactions. In these situations, the officers would fall back on training that they had received to assess the threat and make an immediate decision. In the following account, the officer describes an overall scan of the individual as described above including noticing the suspect's expression and the movement of the suspect's weapon. This assessment proved vital in developing a sense of the rapidly developing situation and taking action.

> Well on this one it turned out there wasn't a lotta space on his landing and so the point guy says, "Hey XXXX, you know, just go ahead and go, or just go in front of me and then just go in, just go point," so I had my UMP (Heckler and Koch's Universal Machine Pistol) slung on my chest and so I was holding on to the railing and I looked at the breacher and gave him the nod like, "boom, hit it," so when he hit the door, as soon as he hit the door, he took one hit, beautiful breach, best breach ever…anyhow, and so when he hit it, I stepped, I looked and when I looked about 3 feet in there was a dead guy right there, I step, I look and I see the bad guy.
>
> And I've seen him and he's from here to the bike right there (six feet) and his feet are probably the corner of that magazine's (two feet) at and he's lying down and I step, I look at him and I throw the bang and then as I look at him, he gets up, or the door opens, he gets up and he looks at me, and he has this look, I'll never forget it, like the utmost hatred, you know, in his eyes, you know, it's like – and he looked at me, like, "What are you doing," almost like, "what are you doin' here," almost like "I thought I told you all to leave me alone" and everything was in slow motion, so when I see him getting up and everything's happening so fast, I'm throwing the bang and he's getting up and I see he's got something in his hand and so when he's getting up, he's already coming at me with a gun, he's got the drop on me, so I'm throwing the bang and I flip my UMP out and he's from here to the filing cabinet (thirty inches) and he's walking towards me and I just get my UMP and we call it a CQB (Close Quarter Battle), where you just punch out. If I had gone on my sites, I probably wouldn't be here right now but basically he's that close where you can just punch out and it's just – whoever was gonna pull the trigger first was gonna win and, sure enough, our guns came up at the same time and actually he –it was a split second and my shot went off before his and – boom – I punched out and just – *bup-bup-bup-bup-bup* – I shot him, I think, I shot him 5 times. I shot 7 times but I shot him 5 times.

Anticipation is a function of processes which unfold at all points of the operation, from planning through the completion of mission execution, and is central to maintaining high reliability. The process takes place at both the individual and team levels with all pieces of the process having to work together in order to anticipate what

will happen before it does and avoid becoming reactionary. Bravo Team excels at this action by applying experience and training to the task so that they can do what they must to be successful. Application of the themes identified here allows the team to anticipate and overcome obstacles to their process and maintain the highest levels of success.

Summary

What emerged from the analysis of Bravo team is an understanding of the kinds of critical incidents encountered by the team and how the team managed those disruptions to sensemaking. Analyses of the data suggests three types of critical incidents which can disrupt sensemaking: (1) unexpected actions of suspects in the field, (2) unexpected activities of other officers on the scene which were often characterized as "mistakes", and (3) intelligence failures. Any of the three critical events were sufficient to produce a debilitating effect on the sensemaking efforts of officers and forced officers to take action in order to recover.

Officers noted that in the face of critical events, immediate action decisions had to be made in order for recovery to take place. Officers reported that in highly volatile situations that they would often fall back on their training and experience when making these decisions. Officers noted that during their training processes they were forced to interact with a rapidly changing environment which required them to shorten the OODA Loop process as much as possible in order facilitate rapid decision making. Though officers noted that tacit decision making represented an almost instinctual response, they also noted that there were times when decision making seemed much more explicit with active assessment periods in which they reported that time seemed to slow down as they

made assessments. A second important process that officers described as being important for recovery from critical disruptions is to continuously move forward during an operation, a process which reorients them to the scene constantly and fosters mental concentration to make sense of the ever changing scene. Furthermore, officers reported that having the ability to perform a variety of roles during operations also proved essential when recovering from critical disruptions, as if one member became disabled or disoriented during the operation, another team members could easily step in to perform their teammate's role. Finally, Bravo Team members noted the importance of having a backup plan at the ready at all times that was well understood by the team, as if the situation went bad the transition to backup was seamless maintaining surprise.

Officers identified the experience of critical incidents as opportunities for learning both at the individual and group level. Officers were particularly interested in identifying mistakes made in the field and determining ways to prevent those mistakes in the future. Interestingly, officers seemed to create a non-judgmental culture of learning where mistakes were not viewed as negative but rather opportunities to identify areas for personal and team level improvement. Mistakes often became the stimulus for designing training measures intended to ensure that when the officers experienced similar events in the future that they would know how to overcome them.

Finally, officers reported that the anticipation of critical events was strongly linked with their field experiences and training which provided the foundation for officers to draw upon in the field. Through these processes young officers develop an understanding of how suspects will react under certain circumstances allowing them to

anticipate suspect movements and anticipate critical events before they happen. The ability of officers to anticipate a suspect's moves is also improved by developing a strong operational focus where everything in the mission is driven from the mind of the officer. This allows the officer to focus and to make peace with what he may have to do during operation should the worst case arise allowing officers to face that worst case without hesitation. Furthermore, officers reported that preparation and intelligence gathering were essential practices that helped minimize the impact of critical events and facilitated eliminating or avoiding variables which would slow the process of the team.

CHAPTER V

CHARLIE TEAM

Team Charlie is composed of full-time officers who are fully dedicated to the SWAT team. Officers in this unit normally conduct missions or are involved in training activities. Based on the participant interviews, the functions of the team include working with high risk warrant execution, hostage situations, barricaded subjects, and other high profile duties requiring advanced law enforcement tactics. It should be noted that at the time of the interviews the officers had recently completed a "call out" the night before. Call outs are operations that occur with little advance notice and take place rapidly and allowing little if any preparation time. They tend to have developed from situations encountered by patrol officers, which have escalated beyond their capacity to handle without tactical assistance. While warrant operations provide time for officers to prepare and gather intelligence prior to the operation, call out situations happen spontaneously allowing less time to coordinate intelligence prior to executing the operation. This difference is noteworthy as the call occurring the evening before was preeminent in the officer's thinking and was referenced frequently during the interviews. Furthermore, the interviewed officers present distinct accounts of warrant versus call out scenarios. To organize the results section for this case, I will address each of the research questions presented in Chapter I and provide examples to illustrate the emergent themes for each research question.

RQ1: What kinds of critical events disrupt sensemaking and coordination in high reliability teams?

Officers noted that instances of true surprise were rare. Officers felt that they were constantly considering the unexpected and were always vigilant which served to limit instances of true shock or surprise during an operation. Officers routinely noted that they were "prepared for anything" and observed that suspects had a difficult time coming up with something that they had not yet considered. This notion appears connected to the training, planning, and mental preparation, which officers engage in prior to operations. One officer explained:

> No I always expect everything to happen – I mean, you start calculating and forming plans in your head because if it's one of those times when it's everything happens and everything lines up and everything's perfect, it's like, "Wow. Okay. I got away with that one." Because usually, it doesn't. Usually, you gotta be able to respond to anything. Especially when it's, you know, some bad guy and he's doing whatever he's doing, you know, you don't wanna be surprised. You start getting that "oh shit" effect and that type of stuff, you know, that kinda sends you down a bad road.

Officers did note that they were still open to "something weird happening," but there was a feeling that such instances should be extremely rare. Officers were extremely reluctant to attach the terms "surprise" or "shock" to their actions even when things did not go as planned suggesting that they were, in fact, prepared for even the most unexpected eventualities. Consider the account of the following officer in which he acknowledges that the mission did not go as planned without admitting that the situation constituted a surprise:

> Just so that way we'll be ready for anything and everything that could possibly be thrown at us. You know, there's been times that I've seen

> things happen and I'm like, "Wow, that didn't really turn out the way I expected it to turn out," but –it doesn't surprise me. You know, 'cause I've seen people do a lotta weird stuff…

This reluctance to accept the idea of being surprised or shocked may be attributed to the fact that the officers functioned on a full-time SWAT unit that was either engaged in operations or training at all times. Officers noted that their full-time status had been called into question recently due to budget constraints, and this may well have played into initial reluctance to admit that they were anything less than perfectly prepared for every situation they might face.

While officers were initially reluctant to admit that they had been surprised during operations, additional probing of the idea about "weird stuff" that had caught them off guard and required recovery efforts generated accounts of critical disruptions. These accounts can be divided into two broad categories: (1) unexpected suspect actions, and (2) unexpected officer actions, which also included mistakes.

The first type of surprise the officers reported were suspects doing something radically outside the expected norm, which tended to be associated with suspects who were capable of defeating normal methods of restraint and suppression. Officers recounted rare occasions when suspects had been able to defeat tools such as CS Gas (military grade tear gas) or tasers which are tools designed to bring suspects into compliance quickly. Therefore, when a subject was able to resist submission after being tasered, the officers were typically surprised. For example, one officer noted:

> We had a guy that – we put a buncha gas in there, no movement, no nothing. And we thought, "Well, either the guy's already committed suicide or he's not in there."

> You know, it's like, how did he get out? And that was one of those things, "Well we know he's in there but what's going on?" You know, and surprisingly just didn't really bug him that much. Didn't have a gas mask. Didn't have anything else, just didn't bother him as much as, you know – you put gas, gas is one of those things, you don't like to be in it. It, you know, sucks really bad and it's just one of those surprising things. So that's, I guess, another thing that kind of made you go, "Wow."

The second type of surprise officers reported encountering was associated with the actions of the officers themselves. Officers typically referenced instances where they had committed some type of error during operations that resulted in the need to recover. Officers often associated these errors with inexperience and contended that with increased "maturity" such mistakes were almost eliminated. For example, the following two officers expound on their experiences involving officer errors. The first officer (Officer #1), having been involved with the SWAT unit for only nine months, recalled an event in which he made an error in which recovery was required. In this case, the officer completely acknowledges the mistake with little hesitation. In contrast, the second officer's (Officer #2) account of mistakes takes a less personalized, almost observational, tone in which the officer chooses to reflect on the cause of mistakes having a strong relationship with maturity and experience. He had been with the SWAT team for over ten years.

> Officer #1 (less experienced)
>
> There's a raid that we were doing a couple of weeks ago where I was supposed to basically pull down some planks so we'd get eyes on the backdoor, and they were supposed to deploy a flash bang on the second story windows which turned out it was just on my side right here. So, as I was looking up to pull my first board, the flash bang went off outside the window and pretty much blinded me because, you know, it was four in the morning. So that kind of surprised me. You are never supposed to look at one when it goes off.

> Officer #2 (highly experienced)
>
> And that's how we make ourselves better. You know if there's one little thing you could think about or something to make something run smoother, that's the importance of a debrief is making sure that, you know, if there is something that everybody else can learn from, you know, you jump on the sword and say, "Hey, look, you know what, I messed up. I did this. I shoulda done that, thinking about it now." And everybody else can kinda benefit from that.…I mean, nobody's perfect…But, you know, as the team matures, as guys get more experience, you know, you don't make as many mistakes.

In contrast to the personalized nature of the account above, note the removed approach of a more senior officer when approached with the mistake question. Particularly interesting is the officer's ability to approach the concept of error from a more observational third party approach derived from repeated experiences and introspection. Across accounts by officers, less experienced officers were more likely to acknowledge personal responsibility for mistakes and give personalized accounts of mistakes which were made while officers with greater levels of experience were more likely to take a more systemic approach in which they viewed errors as a problem that was less personal and more associated with team function and preparedness.

RQ2: How do high reliability teams recover from critical events that disrupt their ability to make sense of and coordinate their activity?

The first concept officers associated with recovering from critical disruptions was the idea of continuous forward movement. When officers faced unexpected events, they felt compelled to continue moving forward to complete their task. Consider the following example. Expanding on one account discussed in RQ1 in which the officer mistakenly looked at a flash bang and was temporarily blinded, the officer's job on that

mission involved using a hooligan (a pry bar device used to gain entry to structures) to pry boards from the fence at the back of the structure to gain access to the backdoor. After the flash bang went off and the officer was blinded for approximately fifteen seconds, the officer reported that to recover from this disruption he continued to perform his duty without the aid of sight. When considering the immediate action after being blinded, the officer reported, "I just hoolied the fence. Repeatedly. I didn't – it wasn't very efficient because I couldn't see. Just my vision was – I mean I was looking right at it. It's just boom. I couldn't see anything. I couldn't see. So I was just wailing at the fence."

Note here that even in blindness, the officer falls back to his mission and training and attempts to complete the task assigned to him. In this case, the officer's sense of duty in completing his assigned mission was central to his recovery and the eventual completion of his assignment and the team's goal. As this particular team relied heavily on the specialized task assigned to the officer, the officer recognized that his "doing nothing" or "giving up" in the face of adversity would negatively impact the team. From his point of view, if he did not complete the task the operation could not move forward. Thus, the officer felt that in order for other members of the team to perform as assigned, he had no option to fail in completion of his role. As he later stated, "Something unexpected is going to come up. So you just kind of roll with it."

Officers reported that when mistakes were made it was also necessary to rely on team support in order to recover from unplanned events. For example, one officer recounted an incident in which he was entering a structure on assault when his magazine

fell out of his gun. The falling magazine impacted the floor and made a loud noise, which could have cost the team the element of surprise, but also caused a delay in the process of entering the structure. This incident required that the officer attempt to locate his magazine and replace it quickly or transition to his backup weapon to get back into a position where he could carry out his assignment, but it also required the rest of the team to adapt to the situation itself as the incident impacted the forward progress of the entire team. In this case, the falling magazine made a great deal of noise, which could potentially alert the suspect to the approach of the team costing them the element of surprise. In this case, when the officer dropped out of the stack to recover and transition to a backup weapon, the team recognized his mistake and transitioned into an even more aggressive approach to attempt to regain surprise. The officer's account of the incident demonstrates both aspects of the recovery process:

> Well you try to get that weapon up as fast as possible or you transition, you know, depending on what weapon system you have. But you also let everybody else know – that you're doing that so that way they're kind of on it, too.
>
> We have certain commands that we give and, you know, you may let the guy know that you're out, or you have a problem. You may need to get that weapon system back up. You know during a primary type deal you're gonna transition to your secondary weapon anyways and you'll do that once everything's kinda calm. Still, the mission is primary…so the team moves forward whether you are ready or not. They transition and move around you to enter as quick as they can.

As the officer makes individual assessments and corrections in order to recover from dropping his clip, he is also mindful of the team and the overall mission. Thus, while he is transitioning to his secondary firearm he is also conscious of the fact that the team has to make adjustments as a result of his weapon system failure and knows he has to signal

to the rest of the team what has happened. Recovery from this incident, therefore, takes place at both the individual officer level and through adjustments made at the team level.

Officers also noted that during critical events they consistently reflected on their training and operational experiences in order to make sense of situations and figure out what to do next. One officer described a situation in which SWAT was called to apprehend a barricaded felon who was in an apartment complex. The officers arrived on the scene where the suspect was located and attempted to verbally interact with him. The suspect reported that he had no intention of leaving the structure, and the officers felt compelled to escalate their tactics to overcome the situation. The officers deployed CS Gas into the structure at multiple points.

The gas becomes so intense, that the suspect then stuck his head out of a roof vent in order to breathe. When the officers noticed the suspect, he then ducked back into the structure and maintained a holding pattern. Finally, after exhausting every option, the officers reported that they had no choice other than to make entry into the structure (a last resort in most cases) and attempt to bring the suspect out by force. However, to the surprise of the officers, particularly considering the large amount of gas that they had pumped into the house, they were unable to locate the suspect for some time. The events following entry into the house were reported as unfolding as follows:

> So we go in there and make our entry. It's a – it's slow, methodical. We go in there. We're looking and checking every room. Checking under everything we possibly can, and we just cannot find this guy. This guy is not there in this house.
>
> So we think he's got to be – still got to be up in the attic. So we have these long tools that we use to poke holes and to basically be able to see in the attic. So, we go in.

> And the guy – he's not in there. We cannot find him. So we think he's got to be – he must have crawled over the next apartment. So we go – we do the same thing for the next apartment. Unfortunately, for the neighbors, we have to destroy the roof of that place basically. And nothing. We just can't find this guy. This guy just couldn't have disappeared. We've got this place surrounded. We gassed him and saw him come out and back in. He's got to be in here. So we're standing in this room, and I'm standing right, you know – there's ten of us in a room going, "Where the heck is this guy?" And all the sudden, I look down, and I'm standing on the guy's foot basically. – he made a noise because I'm stepping on him…So now you've got to go – now here he is, and I've – now I've got to go into my training mode and figure out what I'm going to do with this guy because he was apparently supposed to be armed.
>
> And we've got officers standing right next to him. We've got your partner standing with the back towards him. So, immediately, you've got to go into – it's one of those, "What are we going to do? Are we going to deal with this guy?" Because he's right here.

This situation develops out of the confusion of attempting to determine where the suspect is located and figuring out where the suspect has gone. As noted in the account of the officer, confusion is widespread among officers. However, the officers continue to methodically work through the situation and rely on their knowledge of the situation and their training to eventually eliminate the possibilities until the suspect was located. Upon observing the suspect had managed to hide in plain sight, the officers were forced to adapt rapidly in several ways. First, due to the fact that they were unaware if the suspect is armed or has the capacity to fight, they cannot openly call attention to the discovery of the suspect. Rather, they must covertly alert the rest of the team and orient the team to the newly discovered suspect. The team then focuses on the training that they have received to reflect on the actions that should be taken to facilitate recovery and subdue the suspect. In this case, the officers' reactions and reflection on training, including the assessment of the probable effect of long term gas exposure on

the suspect's will to fight, allowed for a rapid decision making process and actions that completed the mission with no casualties or injuries and with the suspect successfully apprehended. Thus, the operation goes from chaos to success over a period of seconds due to proper observation, orientation, decision making, and action: the essence of the OODA Loop process.

Two other factors emerged in the analysis that officers considered as important to facilitating resilience: (1) a strong sense of team loyalty and at times (2) pure instinct. To illustrate these factors, I will draw upon a story told by one officer about "his worst day."

> I'll - I'll tell you a story about my worst night in tactical.
>
> We had - we had that big squad and we - we ran a narcotics warrant and narcotics had made a buy. And, we did all the briefings…and everybody was good and square.
>
> We knew the guy was in there, and we knew that there were some other people that would be in there with him.
>
> So, I took my battering ram and I knocked the door in. And, the guy inside that we were primarily after was a dangerous man. So - so, what we did was we popped one flash bang through the front door before entry, and we popped one in through the back window on the other - on the - through the back bedroom.
>
> And, what we didn't know, that nobody told us, that in-between, which was several hours time of the buy to the time of entry, they had done a lot of freebasing in there.
>
> So - so, those - those two flash bangs set off one hell of a fireball. That just roared down the hallway. Just astonished everybody, suspects, cops, everybody. And, it was a big giant orange fireball that…burned the mustache off the guy that threw one through the back window. Because of that, all that gas…all that vapors and stuff had also permeated everything like curtains and couches, and instantly all of that stuff was on fire.

> So, we grabbed everybody and threw them to the ground and we're trying - we're trying just - we know we got a fire to fight. But, we got suspects and we know that they're dangerous, so that's a priority, fire no fire.

Note here that even in the face of an explosion, the members of the team focus on the job that they have to do. Training and experience drive the team to continue to focus on the goal of the mission and their duty to each other as team members. At this point in the narrative, it is also interesting that the officers do not know the source of the fireball. While the fire itself emanated from the combination of the flash bang device and the residue of chemicals associated with freebase cocaine (cocaine based compounds derived from purifying cocaine by adding diethyl ether or acetone, both of which are extremely flammable), the officer has no way of knowing this. It is plausible that they may have assumed that the explosion was an attack by the suspect. Yet, even without sufficient information, the team refocuses on the mission at hand and continues to move forward toward that goal, even as unimaginable events continue to unfold. It is their strong mission focus and their sense of what must be done for the mission to be a success, that continues to drive them on even in the face of adversity and, as will be shown next, continually adapting their established procedures in order to recover. The officer continued:

> So, we're slamming people around, putting them on the ground, getting their hands behind their back. And, about that time enough stuff - what we also we didn't know was that they had a bunch of ammunition in there- which started cooking off.
>
> So, by - by now we've got everybody just about handcuffed and their feet secured. And - and, we're grabbing them by the hair in an effort to save their lives, and ours as well, and - and collars and belts and feet and everything else we can grab and screaming for them to get the hell out.

> So, when we get the hell out I was throwing away my - my battering ram and picked up a short shotgun, and I threw them all on the pavement. And, I - and - and, because we - I mean this was pretty critical and I had, I believe five suspects. And I threw them all face first, me and the guys, and we threw them face first on the pavement in the parking lot. And - and, I had my shotgun and I said, "Boys, this ain't going like nobody planned, so nobody move, so I don't have to shoot none of you. And, this will all be good by when the sun comes up." So, they - they held real still - they'd had enough. They weren't - they weren't in the game for this neither.

This piece of text highlights that the officers were forced to adapt the plan on the spot in order to control the situation and complete the mission adapting instinctually to the situation. As the situation continues to deteriorate, the officers are forced to abandon normal tactics of securing suspects and waiting for detectives to arrive and transition to saving the lives of the suspects by dragging them away from the scene by any means available. Further, while officers would normally dominate suspects by force to secure them, the officer falls back on basic instinct to attempt to negotiate with them in order to facilitate suppression and control of the situation while convincing them that they are better off in custody than risking their lives trying to escape. Though the mission was now unfolding far outside what was expected, the officers adapt within the protocols established for the mission and find success by continuing their mission focus and adapting their strategies on the spot as necessary. The ability to adapt to the ever changing situation, yet remain within the parameters of standardized team procedures allows the officers to draw upon an array of skills for success while never allowing the situation to become totally chaotic. Still, officers sometimes present situations in which

skill sets outside of the normal parameters of SWAT training are called upon. This kind of adaptation can be noted in the final segment of the officer's account:

> So, we got them. And, the fire department finally got there. But, the fire department couldn't make entry to put the fire out in the apartment because the rounds were still cooking off.
>
> So, what then happened was one of the - the big fire trucks pulled up front, and they - I don't know what they were going to do with it, but the driver evidently got out to run the pumps or whatever they do. And, when I looked up the fire truck, in neutral, is coming at me at about 15 to 20 miles an hour, and all the cab lights are on and there's nobody inside. So, I started kicking at all the suspects just telling them to run. Because, we're - we're all going to get run over. It's coming dead away for me. And, I said roll, run, I don't care what you do get up. And, I'd rather lost a suspect than had one run over by a fire truck obviously.
>
> - we got them all moved. That thing roared past us by then, all the way across the parking lot and drove straight into another building inside the same apartment complex, which was probably 60 yards away. So, it had built up some speed by the time it'd got there. And, it poked a hole in that - that other building exactly the size the front end of that big monster fire truck.
>
> So - so, then I ran and I - I jumped in, because I was afraid then it was going to come backwards and repeat that whole process. So, I ran and jumped in the cab of the fire truck and discovered, since I've never been in one before, it has one accelerator pedal and about seven other pedals that all look alike in there.
>
> So, I was stomping whatever I could trying, just trying to make it stop…And, finally the driver showed up and the driver said, "Let me in." And, I of course did, and I jumped out and he jumped in. And he - and he said, "I want you to look." He said, "This brake is set. Do you see that?" And it was. And, I said, "Yeah, I see it." He said, it's a brand-new fire truck, it just - but the brake failed. I said, "Whatever."
>
> Went back recovered all five, astonishingly, of my suspects with the help of a couple other guys. Got them back down on the pavement and they eventually got the fire put out.

> And, but I remember saying to the suspects, with - with my shotgun on my hip, "What the hell could go wrong now?" And, I swear within 45 seconds of me saying that it started raining on us.

As one critical event is followed by another, the officers involved are forced to continually adapt and call on a variety of skills and knowledge to make sense of the situation they are facing while maintaining the mission objective of taking the wanted suspects into custody. The officer providing the accounts is even forced to call upon the unexpected skill of driving a fire truck in order to stop it. Also of note is that the officer does not wait for anyone to ask him to leap into action concerning the runaway truck even when we consider that the officer had no idea how to operate the truck or stop it. Still, he jumps into action as required by the developing situation to make sense of it and then apply existing knowledge at an almost instinct level to overcome the situation, execute a recovery to overcome the critical incident, and then return to the mission parameter.

A curious element can be noted in this account and throughout the narratives of the officers in this case. It appears that dedication to the mission parameter continues to dominate their actions. As each adaptation is made, the officers consistently come back to the mission that they were faced with at the outset and attempt to complete it. Thus, regardless of what adaptations are necessary in order to continue to move forward, the primary concern of the officers continues to be a return to the continual process of fulfilling the mission objectives.

RQ3: How do high reliability teams learn from experiencing critical events that disrupt their ability to make sense of and coordinate their activity?

Officers reported drawing on their previous experiences in order to make sense of the situations that they faced and deal with situations as they developed. Officers reported that such experiential knowledge developed over time, and as it developed their performance in the field improved. Interestingly, officers reported that learning was sometimes a function of making mistakes. While officers in this department viewed mistakes as a naturally occurring phenomenon, officers viewed making mistakes as a learning process that applied to officers with limited experience. Officers seemed to consider this a natural evolutionary process that allowed for errors early in an officers' career, but with the expectation that over time officers' performance would become error free as they gained experience. As one officer noted, "…you know, as the team matures, as guys get more experience, you know, you don't make as many mistakes. They reduce over time…until they become really rare."

Officers reported that by making errors early in their career they began to learn what practices made team performance smooth and effective versus what practices impeded the team's progress. The officers noted that this type of critical mistake was invaluable for officers who were learning SWAT tactics, as they needed to make mistakes in order to determine the value of implementing tactics correctly. Whenever possible, these mistakes were made during simulation experiences that were outside the theater of operations, yet officers reported that mistakes made at any point served to reinforce the training of SWAT members and its effectiveness.

Officers also noted that learning and improvement was something that was closely associated with assessment after operations. Officers reported that debriefing

after an operation provided an opportunity for improvement of officer performance by taking a critical look at how the operation was executed. Officers noted that debriefing after experiencing a critical incident was also a time to consider innovating established procedures to further enhance performance and avoid the same response if the same critical incident took place in a future mission. One officer reflected:

> We head back while - while the detectives were doing whatever it is they were doing, then we would designate one, maybe two people to - depending on how many floors you had, to draw out a floor plan of it. And, then we would file that when we got back after the debrief. At the time, everybody that had any part of the operation had to write down what happened and then what they - what went right, what went wrong, what they saw that needed improvement…if something was not working, or was no longer working in a given situation, we figured out a new way to do it and then trained on it.

Less experienced officers also noted that the debriefing period also allowed time for senior officers to assess the less experienced officers and evaluate their performance. Particularly in instances where senior officers noted errors, they would then pass on knowledge that they had gained over time about what counted as a mistake and how to avoid it or rectify it. This provided a mechanism for constant assessment of the younger officers performances, along with an opportunity for continued learning and development. One officer noted:

> Well, they'll definitely let you know if you made a mistake…you know, if anything's bothering anyone or someone that's, you know, senior to you. Like they used to be the new guys…So they're like, "Hey, this is what you need to do. Make sure you do this." You know, all the little things that they learned. They kind of just pass it on.

The debriefing process also presented an opportunity for officers to critically reflect on decisions made at all stages of the operation and then assess the effectiveness

of those decisions. This reflection process was noted as being central to learning and innovating practices and policies through determining the answer to a simple question, "What went right, and what went wrong?" By evaluating the operation with the goal of answering that question, leaders in the team could then make determinations about the training needs of the team and potential ideas for innovating and modifying procedures. Even when officers reflected on the sometimes monotonous nature of debriefing and reflection, they still acknowledged the capacity of the process to foster useful innovation. One officer reflected:

> Usually, it was a day or two later that the sergeants had read and had a little mini meeting with the lieutenants, and then either the lieutenant and the sergeant, or the sergeant and the troops would meet. And, they would discuss it, about what went right.
>
> And, that's - I - you know, I mean after - after you do that four or five times, it gets to be kind of a pain in the ass. But, that's really where all the development came from. We - there was a lot of stuff that we developed to make things go smoother, faster, better, more safe, by doing those debriefings. So, I - in my opinion they're very important.

RQ4: What facilitates high reliability teams anticipating the onset of critical events?

Officers noted that the ability to anticipate the onset of critical events was a process that took place throughout the planning and execution of the mission. Officers noted that the process of anticipating critical events consisted of five distinct factors: (1) planning to suppress the actions of the suspect and overcome contextual obstacles which might negatively impact the assault, (2) insert tactical variables which would serve to adversely affect the OODA Loop of the suspect, (3) mental preparation for battle to attain focus prior to the operation, (4) consideration of what other officers would do

during the operation, and (5) contingency thinking prior to the operation driven by intelligence concerning what the suspect might do when confronted by SWAT.

First, officers reported that the process of anticipating critical events began with efforts to suppress those events during the planning phase through analysis and planning. Officers reported that anticipating and controlling which variables within the environment posed an actual threat and would have to be overcome was something that only training and experience could teach. By determining what obstacles could present potential delays and then creating strategies for overcoming those obstacles, officers determined ways to continuously move forward rapidly toward mission completion. The ongoing process of gathering and evaluating intelligence was critical to pre-operation planning as officers sought out new intelligence and also reviewed previously recorded information about the location. One officer reported:

> We used to search our files. We used to hand draw - anytime we ran any kind of warrant, we would hand draw the floor plan layout in case we ever had to revisit that location. And, we would check the files for that. We would get all the information that we can including pictures. We'd show up for the briefing and everything would be explained to everybody involved… Because, actually you can't get to the person - I mean your first problem, when you get to a location like that, is not the person you're trying to arrest. It's - it's the fact that you got to defeat every obstacle in your way to get to him.

Officers indicated a preference for first hand intelligence, intelligence gathered personally or by other members of the SWAT unit, on the suspect and location involved in the raid. Officers reported that raids were often initiated by detectives who were involved with the investigation of the case itself, but were not SWAT officers themselves. The detectives then briefed the senior members of the team on the situation.

The team then came together to review existing intelligence and become familiar with the case. The team then broke into more specialized roles with each member carrying out intelligence gathering by mining data from the internet (Google Earth, Google Maps, etc.), reviewing existing records on the behavior and history of the suspect, and collecting first hand intelligence:

> We just get up in civilian clothes. We have, you know, just low key cars, and basically, we just – we call it a drive by. We go by with video cameras – hi def video cameras and stuff and just try to get every angle of the house we can get. Usually, it's just a drive by on the frontend, and of course, we use Google Earth, best invention ever, all that kind of stuff just to try to get different angles, see avenues of approach where windows are on the front and back and everything like that.

In contrast, information received from secondary sources, information collected from any source outside of SWAT membership, was reported as suspect. Officers reported that such intelligence was valued and used in the planning process, but noted that it was often incomplete and unreliable:

> We don't believe anybody or what anybody says. He might have the best intelligence, but I'm learning you just – you still act as if someone's in the house even if there might not be. No matter what you hear, you trust what you can see and what your brothers (other SWAT members) tell you.

Using a combination of first hand and second hand intelligence, officers then set about developing a plan for making entry to the structure and securing any and all individuals inside including the suspect. The officers reported engaging in constant assessment of variables, which might present difficulty in completing the entry process. As two of the primary objectives of the team are maintaining speed and surprise, which

officers report as essential to shocking the suspect and preventing them from mounting a major defense, overcoming obstacles quickly proves essential.

Second, officers associated with this team further noted that they would also plan to insert variables into the situation in order to adversely impact the OODA Loop of the suspect. Officers noted that violence of action was essential to causing the suspect to become stuck in their decision making processes and noted several instances where the insertion of variables, which confused suspects, proved effective. Officers reported that by disrupting the sensemaking of suspects during the assault, it reduced the need of officers to anticipate the moves of the suspect as the suspect became incapable of mounting a significant defense. This process of intentionally disrupting the suspect's sensemaking was associated with changing the environment that the suspect was in. One officer noted:

> While he's in his residence, though, I mean you know you can't really take anything away from that until you can maybe get some gas in there and change his environment. You know, change his – he's not gonna be thinking about all his plans. He's gonna be thinking about, "Oh man, this sucks and it's burning and I need to get out of this 'cause," you know –"I can't breathe."
>
> And I mean gas is one of those things, it's – you don't wanna be in it, you know, it's not like pepper spray where it burns and burns and burns, it's just – burns really bad and it, you know, it's hard to breathe and everything else while you're in it. Once you get out, you're like, *[exhales]* much better. So that's one of those things that kinda drives somebody out.

The idea of taking suspects out of their comfort zone by injecting a variable and disrupting their sensemaking was particularly applicable on "call out" situations in which the suspect was barricaded. In such cases, the situations were somewhat stacked

against SWAT from the start, as the suspect knew that they were outside, thus eliminating speed and surprise strategies, and the suspect has had time to fortify their position. This is quite different from warrant situations in which the suspect has little or no knowledge that SWAT is about to kick down the door. Furthermore, in call out situations the officers do not have the luxury of planning and gathering intelligence in advance. Even when speed, surprise, and good intelligence are not available, the officers strive to take actions, which will allow them to get control of the situation and tilt the scale in their favor. Injecting a variable into the situation, which they can control, but is outside the parameter of control established by the suspect, allows the team to gain an advantage by limiting the options of the suspect. Limiting the number of options available for the suspect to choose due to the way the officers control their environment makes it easier for officers to anticipate the suspect's moves. Officers reported that they began to develop a sense of how suspects would react to the insertion of specific variables leading to a greater sense of anticipation. One officer noted:

> As I'm starting to learn how we operate on call outs and the procedures that we follow and, okay, this doesn't work. Let's jump to this and seeing how people react to our different things we throw at them, I guess. You kind of start to see, okay, he's probably going to do this or he's probably going to do this.
>
> No one likes gas. That's a pretty easy one. You throw some gas in a place. Hey, this guy's probably going to come out. I've never met anybody that can stand that stuff.

Limiting of variability allowed officers to account for more potential suspect moves. This process was described as beginning with containment of the suspect:

> You basically start from, I guess, square one. You don't give them any avenues of escape. That's kind of where you start. Containment, nothing

> – no other – the process doesn't keep going on unless containment's set. So that's our biggest goal right off the back. You know?
>
> Getting the teams around – two to four man teams all around the perimeter set up. Get their plans set. So that's kind of the first how we, I guess, deal with the situation. You know, isolate him so that time is on our side basically.

The process then continues by systematically reducing the number of choices available to the suspect. Officers often refer to this as a process of "making the rules" or "controlling the situation." The process evolves as the officers continue to work with the suspect in order to facilitate compliance while simultaneously limiting appealing choices available to the suspect. One officer described the process of taking control of the choices available to the suspect:

> We try to go there and make the rules basically. This is what's going to happen next, and if you don't comply then this is what we're going to do next. And it usually works out to our advantage. So, rather than trying to anticipate what their moves going to be- You try and limit them to the point where they really only got a set amount of choices. That's it.
>
> And that's where it – for the most part, it comes out to benefit us because we're setting the limits. We're setting – you know, we're calling the plays basically, and that's where it kind of works out in our favor.
>
> We've had it, in the past, where we've – you know, we've given folks the opportunity to kind of make their own decisions, and it kind of backfires on us a little bit.

Third, officers also noted that preparing mentally prior to the execution of any operation helped them anticipate potential disruptions. They noted that it was essential to, "Prepare for a battle even if it never comes." This type of mental preparation creates what officers referred to as a "warrior mindset", and this kind of mindset was evident in the accounts of officers consistently throughout this case. Officers reported that

anticipation of resistance allowed them to be ready in the event that the suspect offered significant resistance. In their own words, officers reported the need to be, "ready in case sugar turned to shit." By preparing their mind in advance for the escalated situation, officers noted that they were not caught off guard when suspects did act erratically. One officer noted:

> When you get here, you just operate on a different level. When patrol calls us or when the detectives come to us to go do something, it's already on. The threat level is already raised. That's why they're calling us.
>
> On patrol, the threat level can be raised, but you try to – you always try to calm situations down. You are the negotiator. You are the only person dealing with the situation, and you try to resolve it yourself. And ninety-nine percent of the time, the patrol is successful in doing that.
>
> But when we (SWAT) get here, you know, it's a different mindset. You still try to, you know, use any option you have to deescalate the situation, but at the same time, your mindset is already, hey, you know, we're here for a reason. This guy poses a threat to himself, to us, to anybody else. You have to think like that so that you are ready if something happens and not just standing there hoping it won't.

Fourth, during the operation itself, this particular unit noted that being able to anticipate the moves of brother officers during the operation was as essential to their success as anticipation of what suspects might do. Officers noted that training and experience with other team members had a great deal to do with developing the confidence needed to "know what another officer is going to do." Officers noted that based on this knowledge they could then witness officers in action and subsequently know what to do based on what they witnessed the other officer doing. This synergy of evaluation, anticipation, and decision making was reported as making operations unfold well with a minimal amount of verbal communication. As one of the types of critical

events officers note as most disturbing is errant actions of other officers, the ability to work in sync with other officers to a degree that their actions can be predicted and anticipated prevents shocks to their sensemaking. One officer described the process saying:

> It's one of those things – it's one of those – again, training. We fall back on our training. We've trained for scenarios like this in the past. Our – all of our training is real life training. So we've gone through scenarios. You know, it's one of those things that we've pretty much trained for any time we've run across something like this, or we're just going back – we fall back on our training. We do it so often that it's kind of natural. We kind of – I know what that guy's going to do, and I know what this other guy is going to do.
>
> He pretty much knows that, if I'm pointing, there's something going on down here… It's – everyone kind of feeds off of each other basically.
>
> You know, they automatically know that, if I pull my taser or if I'm – you know, if I've got a lethal cover with my rifle on a certain thing, that something's going on and that person besides me or beside me, he's going to know what the next step is to do whether –
>
> He knows that if I've got a lethal cover or something or someone, he's going to know, "Okay, well, my job is to be less lethal with my taser or whether it be a taser or less lethal shotgun." And the guy besides him is going to know, "Okay, well, I know that those guys are doing this. I have to be hands free to cuff this guy or take him into custody."

Fifth, officers also noted that contingency thinking was essential to anticipating what a suspect would do when encountered. Accounts point out that experience via training and operation in the field was essential to the development of contingency schemas as that experience was drawn upon to determine options available to the suspect in a given situation. Interestingly, the process of contingency thinking was described as both an individual internal process of contingency consideration and as a process that was conducted communally. Officers reported becoming so consumed with "what could

happen" that such planning dominated the thinking of officers even in instances in which they were on "call out" and were unable to plan in advance. Consider the following officer's account:

> You set up plans once you're there. You and your – if you don't have any sight on the door or the windows or you can't even see the place, you still come up with plans, what if plans. What if he comes this way? This is how we're going to deal with it.
> And so every team around the perimeter has – they are also plans. Typically, you go over the same kind of things, but each person or each team develops their action plans.

The essence of contingency planning permeated the idea of "never being surprised." Officers noted that if their contingency planning was thorough, then instances of true shock were reduced or eliminated. By drawing on experience and training there was little if anything that a suspect that might do which would shock the officer to the point that they became stuck in the OODA Loop. To that end, critical disruptions became something that could be anticipated and, in a sense, eliminated. As one officer recounted when asked if he had ever been surprised:

> But, I mean you know, I had already planned and already had the plans in my head so that way I wouldn't be caught, you know, "Oh wow," you know? You never wanna really set yourself up that way. You always wanna be – you always wanna look at things as, "Wow, he could do this. He could do that. If he does this, it's more likely but he could, you know, do the other." So that way you're not shocked or you don't get that startle effect or anything like that. You do that, and you are never going to get shocked to the point that you can't make a call.

Summary

What emerges from the analysis of Charlie Team is an understanding how they manage critical disruptions to sensemaking. The analysis suggests two categories of critical events that are capable of disrupting sensemaking: (1) unexpected actions of

suspects in the field, and (2) unexpected activities of other officers taking part in the operation. Officers noted that the manifestation of either type of critical incident disrupted operational processes for officers who were forced to make sense of what was happening in order to recover from it.

Team members noted that when experiencing critical events, immediate action decision making was necessary for recovery. These decisions were normally tacit decisions in immediate response to unfolding events. Officers did note that training played a large part in their ability to make decisions during high-pressure scenarios as they struggled to assess the situations they faced and make adjustments quickly both as individuals and as a team. Furthermore, officers noted that recovery involved continuous forward motion during an operation, a process that reoriented them to the scene constantly and fostered mental concentration to make sense of the ever changing scene.

Officers associated experiencing critical incidents with opportunities to learn and subsequently improve performance. The process of learning was strongly associated with after action reviews in which officers gave accountings of their actions during the mission while highlighting areas where they believed their performance or the performance of the team could improve. Identified areas for improvement served as the stimulus for group innovation to create new operational processes and to design individual and group training to avoid future critical incidents.

Officers reported that anticipation began with thorough intelligence gathering prior to the mission to identify variables, which could impede and delay the progress of

the team. Subsequently such variables were avoided or a plan was developed to overcome them without sustaining significant delays to team process. Furthermore, training and experience of officers was strongly linked to anticipation of future critical events. This experience was associated with the officer's abilities of detecting irregular patterns of behavior in the suspect or abnormalities in the context of the operation, which might herald a critical event. The ability of officers to anticipate the way suspects might react to the presence of law enforcement was further enhanced by development of a strong operational focus prior to the operation in which the officer considers how the suspect might act in battle, and how the officer would react to the suspect in given scenarios. This process served to prepare the officer for the worst case scenarios so that hesitation would be avoided should those scenarios actually happen.

CHAPTER VI

DISCUSSION AND SUMMARY

Organizations that attempt to achieve high levels of reliability are often under great levels of public scrutiny and have little opportunity for second chances if they fail. High reliability organizing research assumes that accidents may be prevented and systemic catastrophe can be avoided (Shrivastava et al., 2009; Weick, 2004). Weick (1987, 1988, 1993) notes that several conditions are necessary, but not sufficient for minimizing or eliminating error and maintaining reliability including: (1) careful attention to existing procedures, (2) limited trial and error activities, (3) redundancy in the system, (4) decentralized decision making, (5) continuous training with an emphasis on simulation exercises, (6) strategic prioritization of safety within the system, and (7) creation of a culture which is ever vigilant toward the potential of accidents.

In this chapter, I will apply, clarify, and expand the concepts associated with high reliability organizations to High Reliability Teams (HRT's). I begin the discussion by comparing the results for each research question across the three case studies, identifying commonalities and notable differences for each research question across cases. I then continue with a discussion of the connections to previous high reliability organizing scholarship and conclude by examining the implications for future scholarship, the practical application of the results from the analysis, and the limitations of the current study.

Case Comparison

For each research question I begin with a table which summarizes: (1) the relevant research question, (2) the themes identified across cases for each research question, and (3) the presence or absence of a theme across the Alpha, Bravo, and Charlie Team case studies. Following the presentation of the table, I address two areas regarding each question: (1) commonalities across the teams and (2) differences across the three teams.

RQ1: What kinds of critical events disrupt sensemaking and coordination in high reliability teams?

Table 1

Research Question 1 Case Comparison

Research Question	Theme	Alpha Team	Bravo Team	Charlie Team
RQ1: What kinds of critical events disrupt sensemaking and coordination in high reliability teams?	Unexpected Suspect Actions	✓	✓	✓
	Unexpected Officer Actions	✓	✓	✓
	Intelligence Failure		✓	

As shown in Table 1, two primary themes emerged across all three cases that characterize types of critical events. The first type of critical disruption common to all three cases involved the suspect taking an action that was unanticipated by officers.

While officers across all of the cases reported this incident as somewhat rare, officers noted that sometimes suspects would perform actions that were shocking. These events ranged from suspects randomly opening fire blindly on police to suspects defeating SWAT tactics designed to suppress or influence them during the operation. Officers repeatedly noted across the three cases that the human animal is far too complex and the operational theater too saturated with variability to anticipate all of the possible ways that suspects might behave. Yet, while officers acknowledged the complexity and variability of suspects and situations, officers still made every effort to anticipate suspects' actions and moves.

The second area of commonality involved situations in which another officer did something unexpected or made a mistake during an operation. In either of these cases, the officer did something that was outside their anticipated role. Officers in all cases described particular tactics and planning, which were commonly implemented for use in operations and served as the basis for expected officer conduct during the raid. While each case was somewhat nuanced in that teams tended to have somewhat individualized nomenclature surrounding their procedures, terms like "fill and flow" for example, each team noted that officers knew their roles when entering a structure in pursuit of a suspect. When an officer departed from their role, other officers were forced to react to the officer's departure in order to make sure that all aspects of the mission were completed, with officers often having to perform the role of the offending officer in addition to their assigned role. Officers noted that this kind of departure from planned procedures was unexpected based on both training and experience, as all officers were

expected to “know their role and stick to it,” making departures from expected behaviors critical incidents that disrupted their sensemaking.

One reason these two themes emerged across all three cases may be due to the size and scope of SWAT teams. Given that these teams are relatively small and have a tightly focused set of tasks and highly specialized roles that they must perform, they have a well-developed set of expectations for how the suspects and their fellow officers should act. Moreover, this set of expectations is reinforced through rigorous training protocols. While these two themes were common to all three teams, and were quickly apparent, two differences were also observed, in terms of the presence of themes and the way that critical disruptions were experienced.

First, the Bravo Team analysis introduced a third type of disruptive event, surprises due to incorrect or incomplete intelligence. One possible explanation for this theme’s emergence in Bravo Team may be that they had recently completed an operation in which intelligence failures had occurred making this kind of event very fresh in their minds.

Second, in Bravo and Charlie Teams, officers were initially reluctant to admit that they ever experienced surprise or shock during operations. However, officers in Alpha Team more readily admitted instances of surprise. While reluctance to admit surprise could easily be written off as bravado or arrogance on the part of the officers, I believe to do so would be a mistake, as doing so discounts the importance that levels of experience may play in the accounts given by officers. Officers associated with Alpha Team were senior officers with many years of experience while Bravo and Charlie

Teams represented a broader range of experience levels including many officers with only a few years on the force. It is possible that senior officers simply had a broader range of experiences to draw from in recounting stories of surprise.

Interestingly, Bravo and Charlie team members reported their lack of surprise and shock and ability in the face of critical incidents seemed to be correlated with their training regimen and previous operational experiences. The process of experiencing a wide variety of situations via training simulations and previous operational experiences allowed them to gain a deeper understanding of and anticipate a wide range of factors that might influence an operation. When something out of the ordinary did take place, officers had developed a large number of cognitive schemas, given their experience in training simulations and previous operations, to draw upon in order to make sense of the current situation and overcome it. These practices seemed to enhance reliability overall and led to officers who were comfortable functioning in environments that were extremely chaotic and uncertain. As Weick and Sutcliffe (2006) highlight, the lived situation is constantly changing and evolving as we attempt to organize it. However, the rules and recipes for meaning making and action that we have found useful and retain from previous experience provide an important resource that allow people to understand and create order in a situation enabling them to move forward.

RQ2: How do high reliability teams recover from critical events that disrupt their ability to make sense of and coordinate their activity?

Table 2

Research Question 2 Case Comparison

Research Question	Theme	Alpha Team	Bravo Team	Charlie Team
RQ2: How do high reliability teams recover from critical events that disrupt their ability to make sense of and coordinate their activity?	Continued Forward Motion	✓	✓	✓
	Falling Back on Training/Experience	✓	✓	✓
	Instinct	✓	✓	
	Temporal Perception		✓	
	Explicit Decision Making		✓	
	Planning/Backup	✓	✓	
	Cross Training		✓	

As shown in Table 2, when comparing emerging themes regarding practices and processes that facilitate recovering from critical disruptions, two themes cut across all three cases. The first theme captures the idea of continued forward motion by officers or "looking for work" and the second theme address the idea of using training and experience as a resource for sensemaking. The idea of continued forward motion is important for logistical assault reasons. If the officer reacts to an unexpected incident by

simply stopping, this provides a potentially armed and dangerous suspect with a stationary target, which is easier to hit than one that is in constant motion. An officer who stops moving also creates a significant logistical problem for other team members, as they now become stationary themselves and unable to move forward. Being blocked during entry presents a hazard as the team is now bunched together and more vulnerable to assault by the suspect.

The idea of continued forward motion is also important because it creates new perspectives and resources for sensemaking. Officers across all three cases reported that, upon encountering a critical event that disrupted their progress, it was essential to continue to move forward with the mission and to literally keep moving physically forward. By continuing to move forward, officers change the situation and encounter a new set of environmental conditions to make sense of which moves them to reorient to the evolving situation. This ongoing reorientation to the situation connects with Weick and Sutcliff's (2006) idea that taking action may result in sensemaking and that order can be created by taking action and making sense of the action retrospectively. By moving forward constantly and continuing to look for work, the officers reorient themselves continuously until they create an opportunity to apply existing schema or develop new ones that allow them to construct order in their sensemaking. This parallels Raelin's (2007) notion of "plodding" where if we encounter a situation with which we have no experience or idea of how to move forward, we still continue to plod along in an effort to find enough similarities to make connections with existing schema and find a way forward.

Officers reported two benefits that previous experience provided for recovering from disruptions to sensemaking: (1) reduction of surprises and (2) rapid sensemaking after surprises. Having extensive operational experience and having trained for worst case scenarios reduced the occurrence of shock and surprise. It is through training and the subsequent development of experience that officers in the field can make sense of the developing scene and find a way through. Being able to develop a repertoire of experiences and to draw upon these experiences was considered so important that until officers were believed to have a sufficient amount of operations and training under their belt, they were kept out of active participation in raids and relegated to secondary roles such as driving vehicles. This is largely based on the idea that until the officer has a significant experiential resource base to draw upon, they are not yet capable of rapid assessment and sensemaking.

Some differences were also noted across cases as indicated when a characteristic was noted in only one or two of the three teams. One difference focused on the role that consciousness played in recovering from critical disruptions. Officers in Alpha Team and Bravo Team reported that immediate reactions to critical incidents often occurred without them consciously thinking, many times referred to as being instinctual, later noting that previous training and experience likely contributed to their instinctual responses. It is probable that the explicit learning that the team's ongoing reflection on their training and operational experience provides is transformed into tacit knowledge that is used in a preconscious or instinctual way during operations (Conner & Gunstone, 2004; Morgeson, 2005; Raelin, 2007; Schon, 1983). Bravo Team members, in contrast,

did not report this kind of instinctual decision making but talked about an environment where their perception of time slowed down during operations allowing for explicit decision making processes during critical moments. Officers described a perception of time slowing down or an adjustment to the way that they perceived time allowing them to recall events in great detail during their accounts. They also reported this process of slowing down enabled them to consciously think about the unfolding events and making decisions in which they would actively call up and apply information to the situation in front of them. This perception of time slowing down in the heat of the moment connects with the concepts of jamming and flow in which group members experience an almost magical harmonious interaction which is often described using the language of "slow motion" and "it just happens" (Eisenberg, 1990). Eisenberg notes that during moments of flow participants often perceive time as slowing down which enables them to see the situation in greater detail and anticipate what is coming next. One explanation for this ability to achieve jamming or flow is that officers train for worst case scenarios, which expands their capacity for sensemaking and action. As Csikszentmihalyi (1997) observes, when the complexity of action within a context is equal to the complexity of the situation, flow is possible.

A second difference among teams was the notion of planning. When questioned about recovery, officers often would normally first remark that recovery was a process necessary if a suspect did something unexpected, and officers across all three cases stated proper planning of assaults was essential to making sure this did not happen. Of particular importance during planning was the consideration of crushing the OODA

Loop of the suspect. This process involves a three prong approach using speed, surprise, and violence of action to catch suspects off guard, distract them, or otherwise create a state of chaos in which suspects were incapable of figuring out what was going on and reacting to it. All three prongs of the approach must be considered during planning so that all three may be used in the assault in harmony. These three concepts worked together to create an environment that the suspect will perceive as highly chaotic or in Weick's (1993) terms will trigger a collapse in sensemaking or cosmology episode (Weick, 1993). This creates an advantage for the officers as they are able to control the situation and disrupt the suspect's sensemaking, which allow them to execute their plan.

Planning to prevent critical incidents also extended to consideration of backup plans. Alpha Team and Bravo Team reported that prior to operational execution that they would work on contingency and backup plans in case something unexpected happened so that they could quickly transition to the backup plan and recover. Officers noted that planning an alternative entry point in the event that the primary entry point to a structure could not be breached as an example of a back-up plan. This decreases the need for cognitive assessment during the act itself and allow for a rapid almost seamless recovery.

Finally, cross training was introduced by Bravo team as an essential practice that enables them to recover from critical disruptions. Cross training allowed another officer to step in and carry out a task if another officer was unable. Officers across all three cases noted that when an officer committed an error in the operational process, that "other officers were forced to step in and carry out his duties." This indicates a high

likelihood that cross training at least at a rudimentary level was being conducted. However, without a specific mention of the process over all three cases, I felt that inclusion as a theme emerging across all three cases was inappropriate.

RQ3: How do high reliability teams learn from experiencing critical events that disrupt their ability to make sense of and coordinate their activity?

Table 3

Research Question 3 Case Comparison

Research Question	Theme	Alpha Team	Bravo Team	Charlie Team
RQ3: How do high reliability teams learn from experiencing critical events that disrupt their ability to make sense of and coordinate their activity?	Consideration of Experience and Training	✓	✓	✓
	Reflection/After Action Review	✓	✓	✓
	The Value of Mistakes	✓	✓	✓
	Necessity of Accountability	✓	✓	✓
	Critical Events and Innovation		✓	✓

As Table 3 indicates, several themes emerged across all three cases for this research question. Experience, reflection, and training were noted as key processes that enhanced learning. Officers noted that experiencing critical events, either in training or operation, became the impetus for the design of additional training after the operations

were over. After reflection the officers would design training scenarios, which simulated the critical event that they experienced and allow for creation of new procedures. By experiencing critical events, reflecting on them, and using those events to design new training scenarios, officers used these critical incidents to inform their learning.

A critical element of the experience, reflection, must be considered a bit further. Part of the process of identifying critical incidents which influenced future simulation designs necessitated that officers, particularly leaders, be capable of recognizing when such an incident took place and link it to the need for additional training. This process involved communication among team members concerning critical events that took place, how they reacted to those events, a determination of whether additional training was needed on a team or individual officer level, and how that training might be designed. To facilitate this exchange, officers across the cases reported engaging in after action reviews or debriefs. While the form of debriefs varied slightly across the cases, ranging from formal debriefing processes at headquarters to informal debriefs conducted in the field, all teams reported that debrief and reflection were critical to identifying deficiencies in team function and opportunities for future training.

The debriefing process was characterized by officers as being intimately linked to the ideas of an appreciation for mistakes and personal accountability. First, it was noted across all teams that while the teams attempted to avoid mistakes on the whole, errors were considered a part of the learning process for both officers and teams. Second, officers were encouraged to step forward during the debrief process and admit if

they had made an error. Whether in formal or informal debriefing processes, officers were held strictly accountable for their actions and errors. If they failed to acknowledge their mistake, they risked having another senior officer point it out publically. This norm of accountability produced an environment in which officers routinely accepted that they had made errors and brought those errors to the attention of others.

While many commonalities can be seen across all three cases, there was one notable difference. Bravo Team and Charlie Team both connected the identification of training opportunities to the development of innovations in practices to improve team performance. Officers of these teams told stories of errors, which led to innovations in tactics and practices as well as mechanical innovations through the development of new tools to more effectively carry out jobs. I believe that the reason that such innovations were not noted in the accounts of Alpha team were more to do with who was interviewed and the number of persons interviewed for that team than an absence of innovation. For example, one Alpha team officer did note that the "Fill and Flow" concept of tactical maneuvering was developed by the team following a series of events. Previous to the innovation officers had very distinct room assignments in which officers would enter the living room and have to stay there. This required larger squads, and slower progress, thus the officers came up with the fill and flow concept in which they entered a room, secured it, and then moved to the next door. They would fill an area and then flow to another area until the entire structure was secured. However, as this type of innovation was only reported in one officer's account the frequency was not sufficient to merit inclusion as a theme.

An interesting connection can be drawn here to both the notions of High Reliability Theory and Normal Accident Theory, as SWAT teams acknowledge that mistakes are a normal part of team processes but also acknowledge the desire to limit those mistakes as much as possible through reflection and subsequent innovation to processes. What is fascinating here is that the theoretical perspectives do not stand in opposition to one another in practice, rather they work together, with accidents (critical events in this case) providing the necessary impetus for learning and innovations which enhance reliability and thus prevent the critical incident from being so disruptive when encountered again. While the data seems to suggest that NAT is correct in as accidents are accepted as normal, the data also alludes to the notion that attempting to prevent those accidents is possible and that through evolution they may become normal but less frequent.

It is also interesting that the concept of learning is viewed as a continuous process, which unfolds over time involving all members of the team. Officers never stop debriefing after operations and never stop assessing their performance, suggesting that officers never feel as if they "know it all" or have attained perfection in their processes as the environments and suspects are dynamic, requiring continued study to maintain reliability. This finds some connection with Weick's (1993) notion of preoccupation with failure, as officers constantly work to learn in order to prevent failure. Furthermore, learning is a communal process with teams interacting at all levels in the process over time. Particularly applicable to the younger officers, the learning process connects to Vygotsky's (1978) zone of proximal development as officers created

scaffolding to make sense of situation through sharing stories and wisdom about their experience during planning and debriefing sessions allowing the emergence of communal knowledge.

RQ4: What facilitates high reliability teams' anticipating the onset of critical events?

Table 4

Research Question 4 Case Comparison

Research Question	Theme	Alpha Team	Bravo Team	Charlie Team
RQ4: What facilitates high reliability teams' anticipating the onset of critical events?	Pre-Plan for Success	✓	✓	✓
	Primary Intelligence Preferred	✓	✓	✓
	Secondary Intelligence Considered Suspect	✓	✓	✓
	Limit Variability	✓	✓	✓
	Shared Mental Modeling	✓	✓	✓
	Personal Mental Preparation	✓	✓	✓
	Team Loyalty	✓	✓	✓
	Contingency Thinking	✓	✓	✓
	Ritual	✓	✓	
	Variable Insertion			✓

All of the departments involved in the study noted that anticipation of critical events began prior to mission execution with the collection of intelligence. As shown in Table 4, officers noted across cases a belief that the best way to anticipate critical events was to avoid them all together by eliminating or avoiding variables which could be identified prior to the operation which might impede progress. Officers reported that this process involved collecting data associated with the operation prior to mission execution and then analyzing that data with an eye for factors that could impede the process of the mission.

Across all three cases, officers stated a preference for firsthand intelligence collected by members of the SWAT unit rather than relying totally on intelligence from third parties. Officers noted that firsthand intelligence could be trusted while third party intelligence was always considered suspect due to a long history of inaccuracy when information came secondhand. Still, secondhand intelligence was always considered when it was available. The desire for accurate intelligence gathered by the team led to a variety of tactics for gaining information including drive by assessment, fly over assessment, use of photography and video, and the use of the Internet resources such as Google Earth. All information, both first and secondhand, was used to create the most accurate picture possible of the suspect, what the suspect might be capable of doing, and the environment and context that the team would be functioning in. This allowed for the team to begin to consider and plan around any factors, which might slow their process or derail it all together. The idea behind these pre-planning processes was to identify variables which could adversely affect the raid. By identifying these variables and then

avoiding or eliminating them the team can avoid critical incidents before they develop and disrupt team coordination. This process forms the essence of preemptive anticipation.

The concept of controlling variability also extends to considerations of what suspects might do with resources that are at their disposal. A common theme across all three case studies was that officers involved in the raid would identify variables which could be used against them by suspects and eliminate them from the operational context if possible. For example, automobiles in the area, which the suspect had access to and could potentially be used by the suspect to flee the scene, were disabled or sectioned off. By identifying methods of transportation that the suspect might use to attempt escape and then limiting access to those modes of transportation or disabling them all together, the suspects options for evading capture were reduced. This process reduces variability in the operation overall, and thus by limiting the number of choices available to the suspect, the officers force the suspect to act in predictable ways. As a result, officers were able to reduce the potential for the suspect to surprise or shock them with an unanticipated move.

Officers also noted that anticipation and avoidance of critical events was closely linked to knowing what other officers would do during the raid. Officers reported that having a shared mental model of the situation and how the operation would play out, enhanced their ability to make sense of the situation that they were facing, recognize any deviation in the plan, and make sense of the environment during the operation. For example, it was absolutely essential to have every individual who would take part in the

raid present during the briefing sessions prior to the mission. This allowed every officer the opportunity to contribute to the planning process and assured that all of the officers were on the same page concerning how the mission would be carried out. This shared mental model allowed officers to reduce variability in the team's execution of the warrant and limit the number of surprises arising from within the team by enhancing the confidence that all team members had in their fellow officers.

Beyond the team working together to prepare for the mission, the theme of mental preparation prior to mission execution emerged across all three case studies. The two key components identified across cases were the development of an operation focus, sometimes referred to as a warrior mindset, and consideration of team loyalty. Attaining the operation focus is a process of preparing mentally for battle and in doing so preparing for the worst that could happen. Whether making peace with the possibility of using deadly force or with the fact that one might be killed in the line of duty, attaining this mindset and the mental focus that goes with it is a process in which officers make personal cognitive adjustments to prepare them to enter the chaos of an operational theater. The process itself is individualized for the officer, but the focus is always on the mental preparations necessary to attain high levels of concentration during the operation and minimize distraction in order to avoid hesitations during the operation's execution.

The second aspect of mental preparation was reminding themselves of their loyalty and duty to fellow teammates. Officers reported an enhanced sense of duty to others on the team that extended to the point that they were willing to be injured or die rather than see another member of the team hurt. This sense of selflessness on their part

was reported as not only enhancing team spirit, but allowing them to make peace with difficult decisions that they might be faced with during the operation. This sense of team dedication led officers to report that they were willing to pay the ultimate price without hesitation to ensure the safety of others on the team and not fail them. This type of mental preparation is closely connected with the "warrior mindset" but focuses much more on the team as an interconnected group of individuals, each with a heightened sense of dedication to each other.

The final aspect identified by officers across cases as central to the concept of anticipating critical events was contingency thinking. Contingency thinking was noted across all cases and involves officers, either individually or communally, working through "what if" scenarios concerning what a suspect might do during the operation. This process of visualization allows the officers to live the moment, including their response to it, prior to it actually taking place. By doing this, officers reduce the shock associated with the unexpected by visualizing the scenario and what they might do when facing it prior to it occurring. This allows the officer to act more fluidly should the event actually take place during the operation.

One theme that did not emerge across all three teams was ritual. In conjunction with the idea of a shared mental model and the process of attaining a total mission focus prior to the mission, Alpha Team and Bravo Team reported engaging in ritual behaviors in order to attain mission focus across the team prior to mission execution. Whether by "burying the bone" in order to ensure that all issues outside of the mission were forgotten until the mission was over or remembering a fallen comrade to remind the

team what could happen in a moment of lost focus, these rituals served to call the officers back to the plan itself and their sense of dedication to the mission and each other. Attaining this focus limits variability in the operation by ensuring that each officer is singularly focused on the task before them and has eliminated, to the best of their ability, outside distractions, which could pull their focus from the team and its mission.

A second theme that only surfaced in one team was variable insertion. Only Charlie Team formally articulated a concept of variable insertion during operations in which they consciously thought of ways to insert variables into the operational scene to create disruptions and confuse the suspect. This process of confusing the suspect through their creation of a critical event was designed to get the suspect "stuck" in the OODA Loop so that they became disoriented and were incapable of formulating a plan for resistance. While Charlie team was the only team to articulate this concept explicitly as they did, in their case identifying it as a specific part of their planning and execution processes, the stories of other teams seem to indicate their desire to control the operational situation in much the same way.

The implications of the information gathered on anticipation point to a more systemic focus necessary for anticipating the emergence of critical events (Espejo, 1994). For example, as officers describe the process of environmental scanning, officers noted that they were not looking at one specific thing; rather officers reported looking for irregularities in the entire system that constituted the operation. The essential element here is that events are not always unfolding in orderly patterns or in isolation but

in concert with one another (Johanessen, Olaisen, & Olsen, 1999; Marshall, 2004). This forces officers to deal with the entirety of the situation all at once. What makes this possible is twofold: (1) the officers themselves are prepared to some degree for what they will encounter in the environment, and (2) officers have done all that they can to limit variability within the system and thus limit how many factors in concert that they must deal with simultaneously.

This systemic focus toward anticipating emerging situations also highlights the importance of pattern recognition, the ability to recognize anomalies in the system and deviations in routine and expected patterns of performance (Biederman, 1987; Bower, 1986; Marshall, 2004). Pattern recognition applies to how anticipation takes place via recognition of irregularities in the patterns associated with normalized behavior in suspects. For example, officers made numerous references to suspects who behaved in ways that "the officer knew something was wrong." This implies that officers were conscious of the behaviors as they were unfolding during the interaction and that they recognized those patterns of behavior as incongruent with their expectations based on experience and training. Here officers may not know what the suspect intends on doing, but they do have some inclination that some critical event is about to take place based on irregularities noted in the patterns of behavior exhibited by the suspect (Biederman, 1987; Bower, 1986; Espejo, 1994; Johanessen et al., 1999; Marshall, 2004).

Theoretical Implications

Several theoretical implications for high reliability organizing emerge from this study. To begin, many of the concepts of HRO were also noted in this study of HRTs.

For example, Weick's (1987, 1988, 1993) concept of careful attention to existing procedures is evidenced in the way that the SWAT teams rely heavily on training and procedure to make sense of developing events. Redundancy in the system is also connected to the way that SWAT teams function, with team members citing the necessity of officers who had been cross trained in order to complete tasks when an officer becomes disabled. Decentralized decision making is evident with officers reporting that decisions were often made at the individual officer level without discussion with superiors or other officers relying on a shared understanding of events developed prior to engagement. Continuous training via simulation was also noted as officers were trained in simulation exercises where they were placed in situations similar to, and often worse than, those they face in the field forcing them to make decisions in real time. Weick's concept of creating a culture which is ever vigilant toward the potential of accidents, is also strongly correlated with SWAT team operations in that officers were constantly reminded via training and experience that errors could mean death or injury of themselves or others and that the team relied on vigilant efforts to limit errors of all kind and at all levels of the team.

This study also elaborates at least two of Weick's (1987, 1988, 1993) concepts. First, Weick suggests that high reliability organizations strategically prioritize safety, suggesting that they make safety the priority in their operations. While one can argue that SWAT teams do consider safety, SWAT also couples that consideration with a willingness by other officers to put themselves at risk for a fellow officer. While one can argue that SWAT members place a high priority on safety, one must also

acknowledge that SWAT officers do accept the inherent danger and risk within the system as part of the job with which they must not shy away from, but must interact with. In doing so, some officers were willing to actively place themselves in danger if it became necessary to protect other team members. This prioritizes safety for the team, but at times at the expense of individual team members.

Second, Weick suggests that high reliability organizations should limit trial and error behaviors; however, SWAT teams suggest that trial and error is closely linked to innovations in practice within a defined structure of operation. For example, the "fill and flow" concept developed out of officers observing deficiencies in existing procedure which forced them to try something new which could only fully be evaluated during operations themselves. The new procedure was tried, deficiencies were noted and suggestions made for improvement, and eventually though a trial and error process the procedure was refined and advanced to standard operational procedure. This reconceptualizes Weick's concept as it allows for trial and error, but is guided by existing operational constraints and a foundation of experience and team discussion.

There were also a number of differences in some of the practices that characterize HRTs when compared to HROs. These differences include: (1) controlling variability during team function, (2) accepting the value of the unexpected, (3) continuous forward motion, and (4) the role of tacit and explicit knowledge.

The first concept of interest is controlling variability during team activity and consists of identifying, managing, and controlling or avoiding variables that may adversely impact team processes during operations. The SWAT teams gathered

intelligence to determine which variables may slow their progress and to develop strategies for overcoming those variables. This process is essential to enhancing reliability as variables which may manifest in the form of critical events are identified and planned around prior to execution, allowing the function of the team to maintain the highest levels of reliability. In contrast to the concepts of HRO, this HRT procedure seeks to analyze those factors which could produce a critical event in order to prevent that event from manifesting. This extends to both the suspect and the context surrounding the suspect, as well as attempting to limit variability in the perception of the operation between the officers involved in the raid. I argue that this process, particularly attaining a shared mental construct, is made easier by the use of small groups or teams. For example, while attaining and maintaining a common mental construct at the organizational level is difficult at best, with a smaller team variability in the shared mental construct can be controlled to a greater degree.

The second concept is the development of an appreciation for unexpected events or mistakes and their value in pushing evolution and innovation forward. Mistakes and unanticipated events tell us something about the nature of our planning and procedures by graphically illustrating areas in which improvements can be made. While the premise of HRO is avoiding the unexpected, HRTs embrace the unexpected as necessary stimulus for evolution of practices within the team in order to enhance reliability and foster continuous improvement. This does not diminish Weick's (1987, 1988, 1993) notion that maintaining vigilance toward the potential of accidents should be maintained or that groups should look for opportunities to err on purpose, rather it embraces the idea

that a context needs to be created to treat accidents as opportunities for learning and evolution. Appreciation of the value of the unexpected and mistakes finds opportunity for relatively easy application at both the group and organizational level; however, it is the innovation and change resulting from the realization of procedural inadequacies that is easier to facilitate at the group level, as adaptations can be made quickly and inadequacy overcome.

Third, the concept of continued forward motion toward the mission goal also appears relevant to promoting high levels of reliability. By continuously moving forward, even in the face of adversity and looking for work or any activity which could bring about a positive result for the team or enhance the reliability of the team, two important outcomes were realized: (1) officers stayed mentally engaged and focused on the outcome of the mission and (2) officers did not get bogged down logistically when the unexpected took place. This concept appears particularly important when a HRT is faced with an unexpected event forcing officers to continue to move forward in an effort to reorient themselves to the scene and make sense of it. The concept of continuing to move forward when faced with a developing situation that one did not understand would appear to contradict HRO's opposition to trial and error (Weick, 1987, 1988, 1993a, 2002); as the participant charges onward in an effort to find his way forward, HRT views this trial through fire as a way to push forward until sense is restored. This is a concept which is not positively affected by the size of the group itself and could just as easily be applied to the larger organizational structure and particularly at the individual level.

Finally, the role of tacit and explicit knowledge must be considered. During the critical moment, team members report making decisions in two distinct ways which draw upon their training and experience with some officers reporting an unconscious "moving forward" or "just acting" and other officers reporting a change in their perception of the temporality of events allowing for greater time for assessment. These two concepts appear antithetical at first, but they give clues that they may in fact work harmoniously as participants continue to move forward in the developing situation and reorient themselves to what other parties are doing around them. These concepts are somewhat unique to HRTs in that we can observe and analyze the thought processes and reactions of individual actors. Within the concept of HRO theory while the actions of individuals have been considered (Perrow, 1981, 1984a; Weick, 1993a; Weick & Sutcliffe, 2006, 2007) the thought processes of the individual during the critical moment have yet to be fully explored. To that end team structure presents an interesting opportunity to examine the individual actor as they attempt to make sense of and interact within the critical moment itself.

Future Research, Limitations, and Practical Application

When considering future research, one must consider the ever expanding number of criteria surrounding reliability within teams and organizations and note that the door is open to the addition of other criteria which may enhance organizational and team level reliability. While this piece and previous literature outline criteria which enhance reliability during operations, no assertion can be made that the lists themselves are exhaustive or that reliability is as formulaic as applying a series of principals. Rather,

this work seeks to extend existing research, while allowing for further expansion of the concepts which foster reliability at both the team and organizational level. To that end, future research should seek to test the assertions made here and in previous literature in an ever expanding attempt to discover and detail practices which foster reliability and rapid recovery. In conjunction with that effort, I believe that it is important to view a variety of contexts to determine factors which find application across multiple sites. Of specific interest to me is the decision making processes which are engaged in by HRT members during critical incident assessment and resultant action steps. As noted earlier, officers normally report that their actions are tacit or are explicit and associated with a slow motion temporal pattern in which a conscious cognitive assessment is possible. While both methods have shown themselves to be effective, I believe that it would be interesting to compare the two styles to determine what factors bring about tacit responses versus explicit ones. Furthermore, I believe that an interesting line of research concerns exploring the linkages, or possible distinctions, between the two concepts and the role that orientation plays in bringing the two concepts together.

It would also be interesting to explore further the concepts of experience and simulation and their effect on rapid decision making. Recovery, in particular, is closely related to these concepts. Future research should seek to determine how the intensity and type of simulation is enhances decision making in the moment. It would also be interesting to study how new team members are integrated into the team and analyze how the intensity and type of training is connected to the speed in which they are able to

develop rapid decision making and recovery techniques which enable reliable performance.

Perhaps the largest limitation of this work and opportunity for future research is its primary reliance on an interview methodology. While the retrospective generation of stories of critical events gives some interesting ideas about the events as they take place and how we might recover from them, they represent recollections of participants in the events themselves. Thus, the study is limited by my capacity to only look at data that is retrospective. In future research, it may prove beneficial to perform extensive shadowing and participant observation techniques which will allow for real time analysis of critical events as they unfold (Becker, 1958; Czarniawska, 2007; K. M. DeWalt & B. R. DeWalt, 2002; Jorgensen, 1989). Furthermore, the study is somewhat limited by the inability to go back and perform follow-up interviews with subjects in an attempt to flesh out additional details. This would be useful in further examining some of the principles informing decision making processes. Finally, and perhaps as a matter of future research, I feel that the study is limited by the fact each case represented all male teams. While female SWAT officers are somewhat rare, as more and more women join the elite unit it would be interesting to determine if their perceptions on decision making differ from their male counterparts.

Perhaps the most important practical implication of this work is in the way that we look at reliability in large organizations. This work gives some indication that we might better organize our decision making models around decentralized and highly experienced team models. However, in doing so a restructure of current corporate

thinking is imperative. Organizations would be forced to abandon long held decision making models that are grounded in hierarchical bureaucratic oversight and extend trust to operational teams within the organization at every level. This alone represents quite a mental transition for the groups, but provides interesting opportunities for advanced remodeling of corporate structure.

Finally, this work also seems to indicate the value of reflective practices and accountability within the teams themselves. By creating a culture where this is possible, and modeling that culture after the ideas found here, individual team members should be less apprehensive about coming forward to take responsibility for errors and postulate innovation. However, this type of ideological jump may take some time to accomplish.

Summary

This dissertation attempts to contribute to the advancement of theory surrounding high reliability organizing and the concepts surrounding recovery after critical events and disruptions by beginning to examine the nature of events which have the capacity to disrupt. Once we begin to understand the nature of critical events and ways in which they occur, we can then seek to prevent or avoid them enhancing the reliability process.

Furthermore, this work posits that the use of team structures, smaller than those of the often examined organization, produce interesting opportunities for reliability enhancement. The size of these teams allow for enhanced understanding of operational procedure and variability between participants and more rapid adaptation in the face of critical incidents. This work also contributes to literature surrounding high reliability

organizing by refining and expanding existing concepts and adding new categories for consideration during team formation, preparation, operation, and after action review.

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APPENDIX A

TEAM RESILIENCE INTERVIEW GUIDE

1.) Walk me through a typical operation from planning through execution and debrief?
2.) Tell me about a time when you were on an operation and a major surprise happened that disrupted your typical way of doing things. Walk me through the sequence of events.
3.) As you think about all the people that were present at the operation, how do you think each person made sense of the situation?
4.) What did you and your team do to recover from this surprise? How did you find your way forward?
5.) What would have needed to have been different in this situation for this mission to have gone normally?
6.) What would have needed to happen for you to have anticipated this situation? What would you have needed to be aware of and prepare for to have anticipated this situation?
7.) As you think about future operations, what did you learn from situation?

APPENDIX B

CONSENT FORM
Bouncing back from crisis: Resilience in high reliability teams

Introduction
The purpose of this form is to provide you (as a prospective research study participant) information that may affect your decision as to whether or not to participate in this research.

You have been asked to participate in a research study to determine how teams recover from unexpected events. The purpose of this study is to determine how teams and team members communicate in order to adapt to unexpected events which disrupt their team processes. Using interviews, I will solicit stories regarding your experiences with team adaptation during these critical disruptions and subsequent decision making. The hope is to identify key communication factors that facilitate rapid adaptation to adversity and allow for recovery from unplanned events. You were selected to be a possible participant because of your team experience.

What will I be asked to do?
If you agree to participate in this study, you will be asked to be interviewed concerning your experience with teams, adaptation, and decision making processes. This study will take one hour.

Your participation will be audio recorded.

What are the risks involved in this study?
The risks associated with this study are minimal, and are not greater than risks ordinarily encountered in daily life

What are the possible benefits of this study?
You will receive no direct benefit from participating in this study; however, this study will benefit society by detailing the process of rapid adaptation and decision making; in so doing the day to day organizational function of society should be positively impacted and the nature and accuracy of decision making should be improved.

Do I have to participate?
No. Your participation is voluntary. You may decide not to participate or to withdraw at any time without your current or future relations with Texas A&M University being affected.

Who will know about my participation in this research study?
This study is confidential and all records associated with this matter will be securely stored by the Brad Wesner and will be for his eyes only. Recorded records will include digital audio files and electronic transcriptions of those files. All files will be accessed only by the PI and will be password protected at all times on a hard drive that is not associated with any network and is

encrypted. No identifiers linking you to this study will be included in any sort of report that might be published. Audio recordings will be kept by Brad Wesner for 1 year and then will be destroyed.

Whom do I contact with questions about the research?
If you have questions regarding this study, you may contact Bradley Wesner, bswesner@tamu.edu

Whom do I contact about my rights as a research participant?
This research study has been reviewed by the Human Subjects' Protection Program and/or the Institutional Review Board at Texas A&M University. For research-related problems or questions regarding your rights as a research participant, you can contact these offices at (979)458-4067 or irb@tamu.edu.

Signature
Please be sure you have read the above information, asked questions and received answers to your satisfaction. You will be given a copy of the consent form for your records. By signing this document, you consent to participate in this study.
**Only include the following if recording is optional:*
_____ I agree to be audio recorded.
_____ I do not want to be audio recorded.

Signature of Participant: _____ Date: _____

Printed Name: _____

Signature of Person Obtaining Consent: _____ Date: _____

Printed Name: _____

VITA

Bradley Scott Wesner received his Bachelor of Arts degree in criminal justice from Ball State University in 1997, his Master of Arts in applied communication from Indiana University Purdue University of Indianapolis in 2007, and his Doctor of Philosophy in communication from Texas A&M University in 2011. His research interests include speed and efficiency in teams, interdisciplinary and transdisciplinary team work, high reliability organizing, and organizational resilience.

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